Sagamore

Math 8

Quarter 3

Name _____

Teacher _____

Period _____

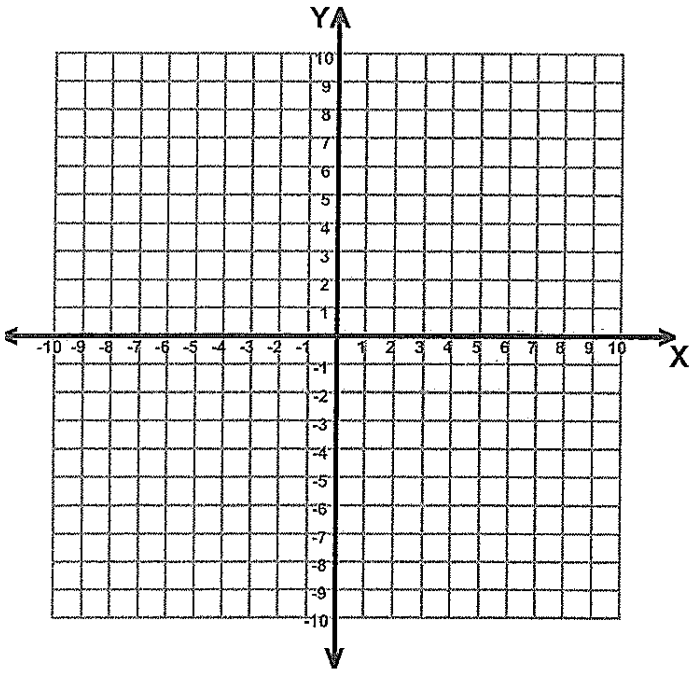
Unit 8

Transformations

	Date	Lesson	Topic
		1	Translations
		2	Reflection
		3	Reflection
		4	Rotations
			Quiz
		5	Dilations
		6	Mixed Review
		7	Double Transformations
			Review
			Test

Transformations

Review:



Plot each of the following points and label.

A (2, 3)

B (-5, 1)

C (-4, -6)

D (5, -3)

E (8, 0)

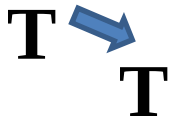
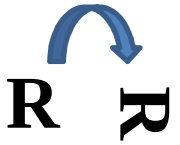
F (0,0)

G (-6, 0)

H (0, 5)

Transformations – The word transform means "to change." In geometry, a transformation changes the position of a shape on a coordinate plane. What that really means is that a shape is moving from one place to another. There are three basic transformations: **Translation, Reflection, and Rotation**. They are transformation where the size and shape remain the same. The fourth transformation is **Dilation**. This is when the size changes, but the shape remains the same.

Key words to remember:

Translation – Slide 	Reflection – Flip 
Rotation – Turn 	Dilation – Changes size 

Lesson 1
Translations

Vocabulary:

Congruent – same shape and same size; polygons are congruent if all corresponding sides are equal.

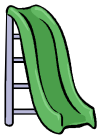
Translation - A transformation that slides a figure from one position to another without turning.

In a **translation** the shapes are **congruent** (≅) (same shape and same size), however the location changes.

On the coordinate plane: When the slide is left (-) or right (+) this effects our domain (x).
When the slide is down (-) or up (+) this effects our range (y).

Remember a point is always written (x, y) and every point need parentheses around them!

Translation -

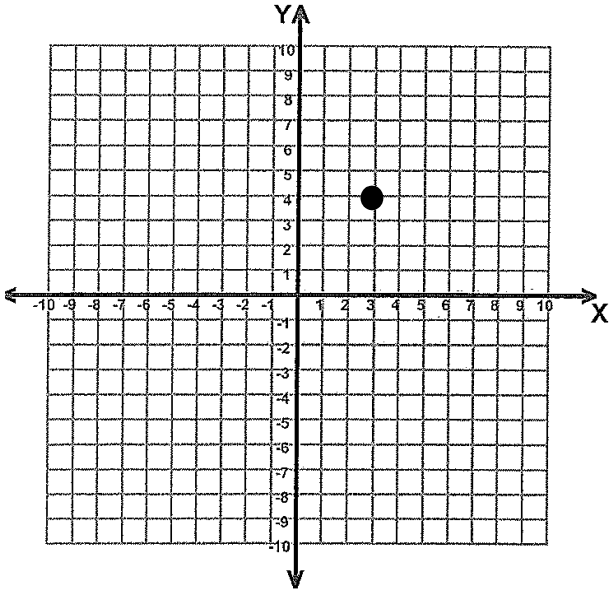


Examples:

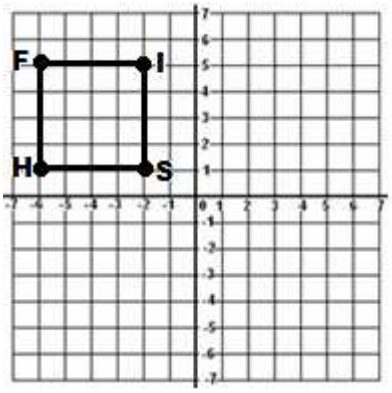
1) Using the ordered pair (3, 4):

a) translate 2 units to the right (3 + 2, 4) ( )
b) translate 2 units to the left ( )
c) translate 2 units down ( )
d) translate 2 units up ( )
e) translate 5 units to the left and 3 units up ( )

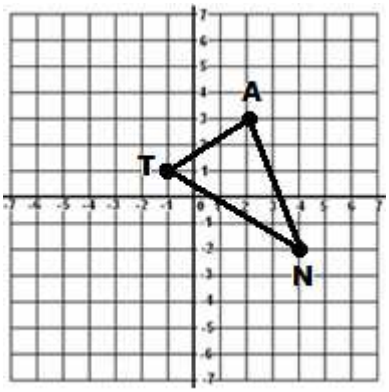
How can we check if the new points are correct?



2) Translate the square below 8 units right



3) Translate the triangle below (x - 6, y + 2)



Remember to label all of your new points!

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4) Translate the following points A (-2,-1), B (-5,-1), C (-3,-5) 4 units up and 1 unit left

and list the new points A' ( ) B' ( ) C' ( )

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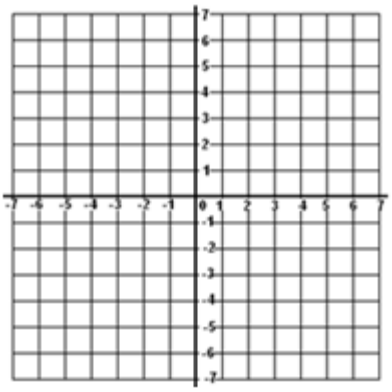
5) a) Plot A (1, 3), B (1, 5), and C (3, 3).

b) Translate 2 right and 3 down.

c) List the new coordinates:



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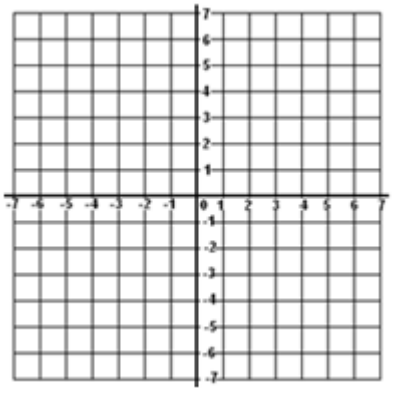
6) **A)** Plot LION if L(-2,1), I(-2,0), O(-4,-2), and N(-4,2) **B)** Translate $T_{6,4}$ and list the new coordinates.



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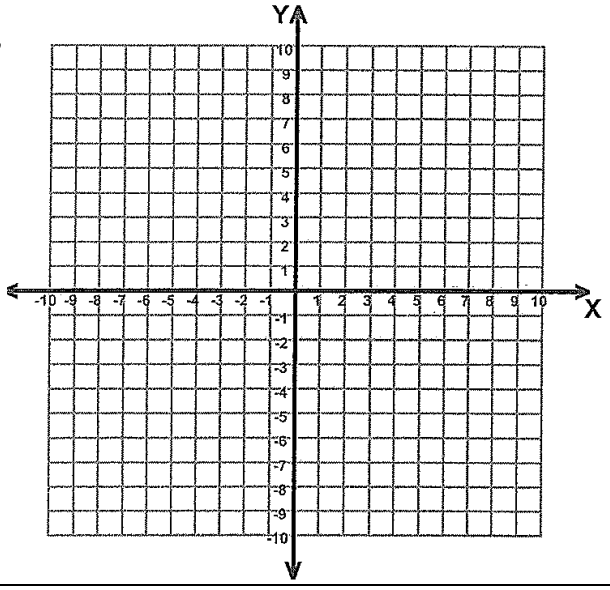
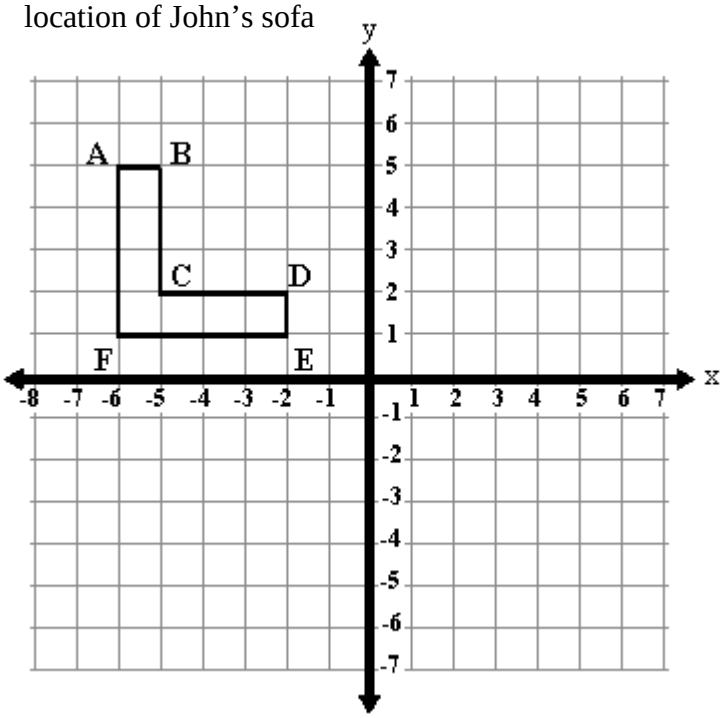
7) Name the translation that moved $\Delta ABC \rightarrow \Delta A'B'C'$ if A (1, 3), B (1, 5), C (3, 3) moves to A'(-1,-4), B' (-1,-2), C' (1,-4)

Try These:

1) Graph the ordered pairs Q(4,-2), R(6,-2), S(7,-4), T(2,-4), translate the figure 5 units up and to the 7 units to the left.



2) John uses a grid to decide how to arrange his living room furniture. The shape and position of John's sofa are shown on the grid he moves the sofa 3 units to the right and 6 units down. On the grid draw the new location of John's sofa



A ( ) A' ( )
B ( ) B' ( )
C ( ) C' ( )
D ( ) D' ( )
E ( ) E' ( )
F ( ) F' ( )

3) Given the ordered pairs, X (3,7), Y (2,4), Z (5,4) translate figure XYZ 5 units down and 2 units to the right. What are the new coordinates of figure X' Y" Z'

4) If P(1, 3), I(6, 2) and G(7, 1), state the coordinates of their images after the following translation: $T_{0,6}$

5) In one word, what is a translation? _____

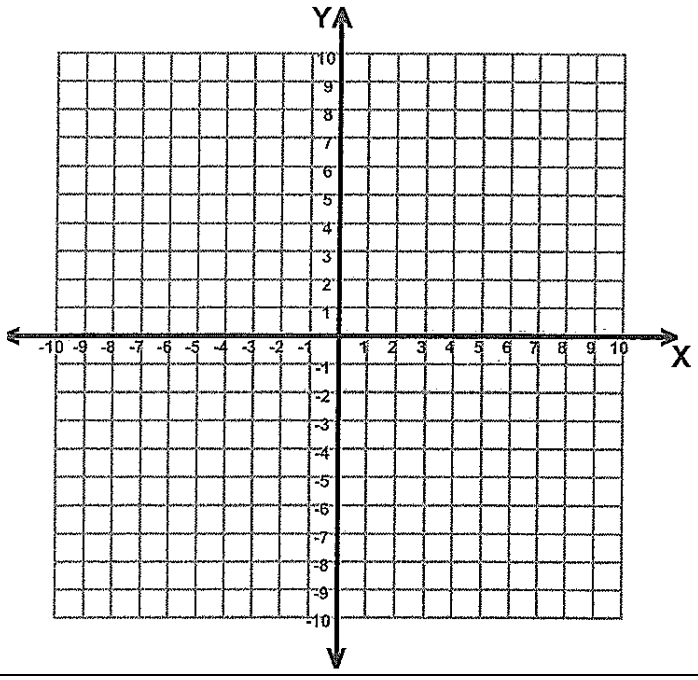
Lesson 1: Classwork/Homework

1) Graph the points:
A(-1,1), B(-1,6), C(-5,1), D(-5,6)

a) Translate these points:
7 units down and 4 units to the right.

b) Label the new figure A'B'C'D'.

c) Name the new points:
A'( ), B'( ), C'( ), D'( )



2) Given the ordered pairs, A(2,3), B(3,3), C(2,-1), D(3,-1), translate figure ABCD

5 units down and 4 units to the left. What are the new coordinates of figure A'B'C'D'?

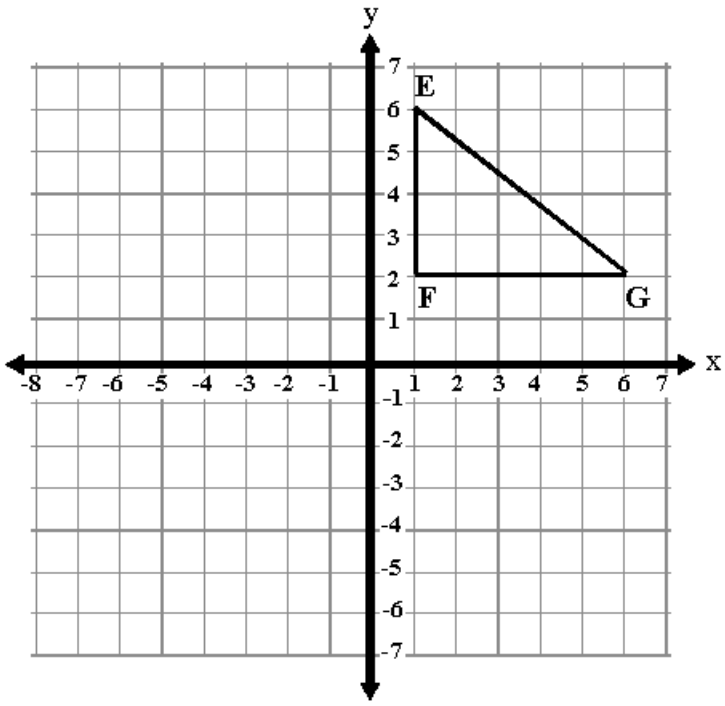
A'( ) B'( ) C'( ) D'( )

3) Given the ordered pairs, W(0,5), X(4,5), Y(5,2), Z(-1,2), translate figure WXYZ

4 units to the right and 2 units up.

W'( ) X'( ) Y'( ) Z'( )

4) Translate the figure EFG
3 units down and
4 units to the left.
Graph each point.



5) If P(1, 3), I(6, 2) and G(7, 1), state the coordinates of their images after the following translation:

$(x, y) \rightarrow (x + 4, y - 2)$

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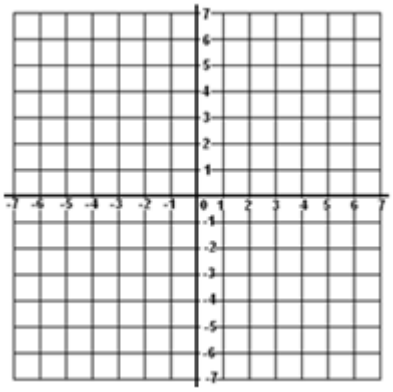
6) A) Plot RATS if R(-2,3), A(1,3), T(0,-1), and S(-3,-1)



B) Translate $(x, y) \rightarrow (x + 4, y - 5)$ and list the new coordinates.

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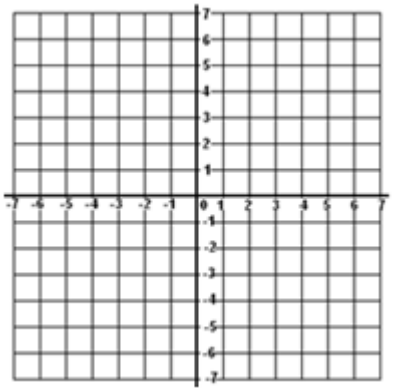
7) A) Plot BAT if B(1,3), A(3,1) and T(2,0)



B) Translate 4 units right and 6 units down, and list the new coordinates.

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8) A translation moved Y(4, -2) O(0, 2) U(5, 2) to Y'(-1, 1) O'(-5, 5) U'(0, 5). Name the translation.

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9) What is the image of point (2,5) after the translation that shifts (x,y) to $(x + 3, y-2)$?

A) (5,8) B) (0,3) C) (5,3) D) (0,8)

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10) What is the image of the point $(-5, 2)$ under the translation $T_{3,-4}$?

A) (-9, 5) B) (-8, 6) C) (-2, -2) D) (-15, -8)

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11) A translation moves $P(3, 5)$ to $P'(6, 1)$. What are the coordinates of the image of point $(-3, -5)$ under the same translation?

A) (0, -9) B) (-5, -3) C) (-6, -1) D) (-6, -9)

---

12) The image of point $(-2, 3)$ under translation T is $(3, -1)$. What is the image of point $(4, 2)$ under the same translation?

A) (-1, 6) B) (0, 7) C) (5, 4) D) (9, -2)

Lesson 2
Reflection
Over the x or y axis

Vocabulary:

Reflection

Another type of **transformation** is a **reflection**.

Reflection – A flip of a figure over a point or a line.

When there is a line of symmetry it could also be called a line of **reflection.** A real life example of this would be a mirror. When you look at your **reflection** in a mirror it still has the **same shape** and the **same size**, however the **orientation** has changed. A figure and its reflection are congruent.

On the coordinate plane: When the point is reflected in the x-axis (change the sign of y) (X, Y) (X, -Y)
When the point is reflected in the y-axis (change the sign of x) (X, Y) (-X, Y)

Examples:

1) Using the ordered pair (4,5):

a) Reflect it over the x-axis. _____

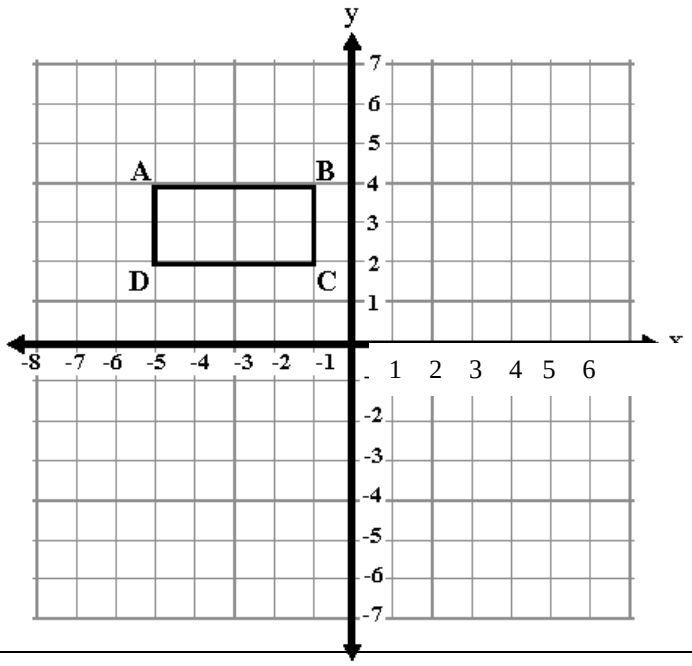
b) Reflect it over the y-axis. _____

2) Using the ordered pair (-3, 5)

a) Reflect it over the x-axis. _____

b) Reflect it over the y-axis. _____

3) Matt drew a rectangle on the grid to the right.



a) State the coordinates of the rectangle.

A ( ) B ( ) C ( ) D ( )

b) Reflect the rectangle over the y-axis and graph it.

A' ( ) B' ( ) C' ( ) D' ( )

c) Reflect the original rectangle over the x-axis and graph it.

A" ( ) B" ( ) C" ( ) D" ( )

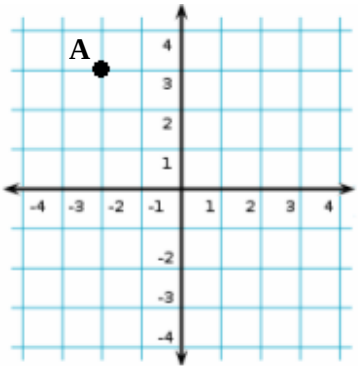
4) The coordinates of a triangle are:
E (3, -2) F (1, -2) G (3, -6)

a) What are the new points if you reflect it over the y-axis. E' ( ) F' ( ) G' ( )

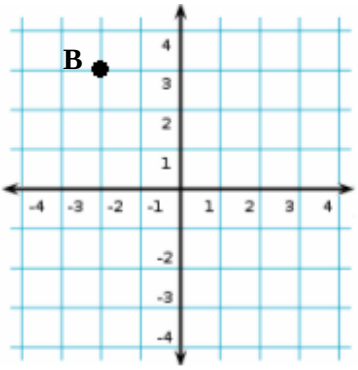
b) What are the new points if you reflect it over the x-axis. E" ( ) F" ( ) G" ( )

Try These:

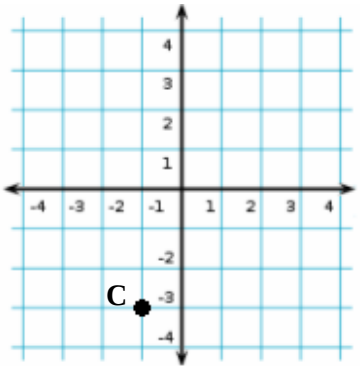
1) Reflect in *x*-axis



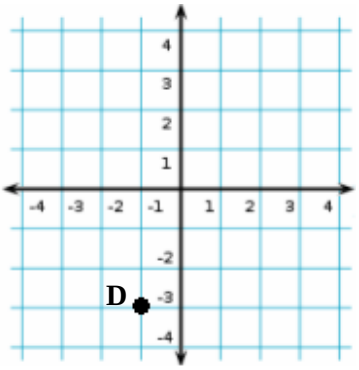
2) Reflect over *y*-axis



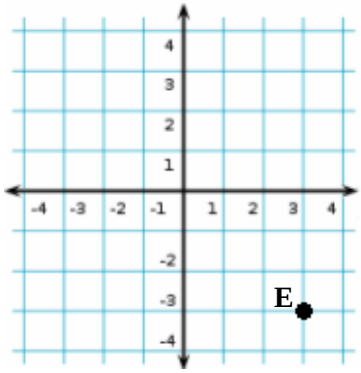
3) Reflect in *x*-axis



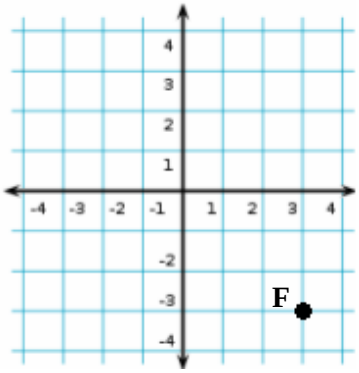
4) Reflect in *y*-axis



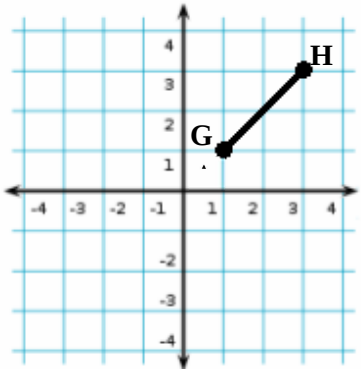
5) Reflect in *x*-axis



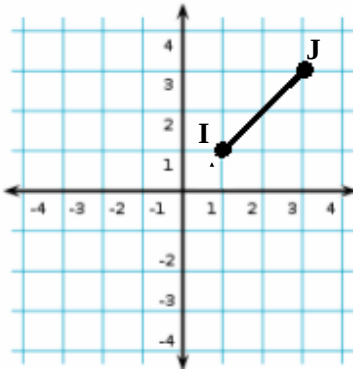
6) Reflect in *y*-axis



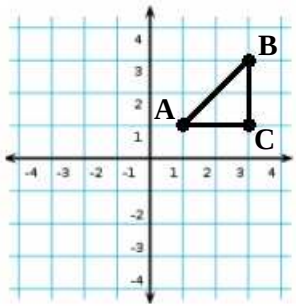
7) Reflect in *x*-axis



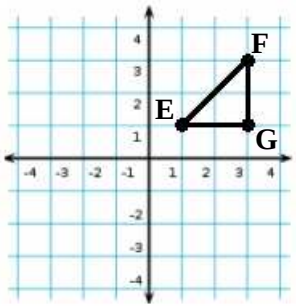
8) Reflect in *y*-axis



9) Reflect in *x*-axis



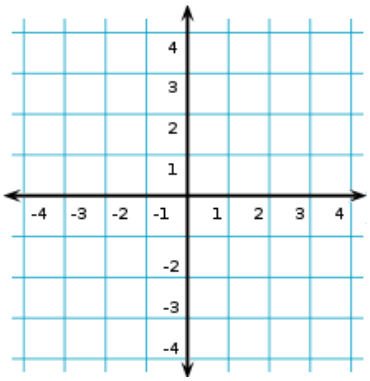
10) Reflect in *y*-axis



11) What is another name for a reflection?

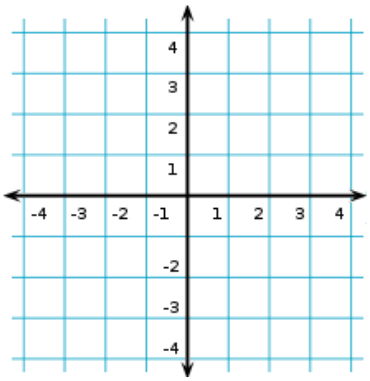
12) Plot the point, then reflect it in the *x*-axis and list the new coordinates

A (-4, 3)



13) Plot the point, then reflect it in the *y*-axis and list the new coordinates

B (-3, -3)



Lesson 2: Classwork/Homework

1) Using the ordered pair (3,-7):

a) Reflect it over the x-axis: _____

b) Reflect it over the y-axis: _____

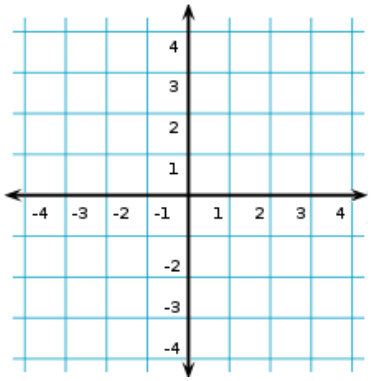
2) Using the ordered pair (-2, -5)

a) Reflect it over the x-axis: _____

b) Reflect it over the y-axis: _____

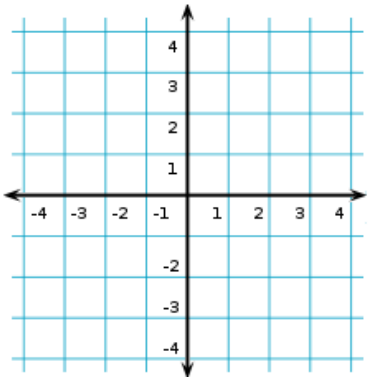
3) Plot the point, then reflect it in the *x*-axis and list the new coordinates

A (2, 1)



4) Plot the point, then reflect it in the *y*-axis and list the new coordinates

B (3, -2)



5) a) Plot the ordered pairs:
P(2,0), Q(6,0), R(6,-4), S(2,-4)

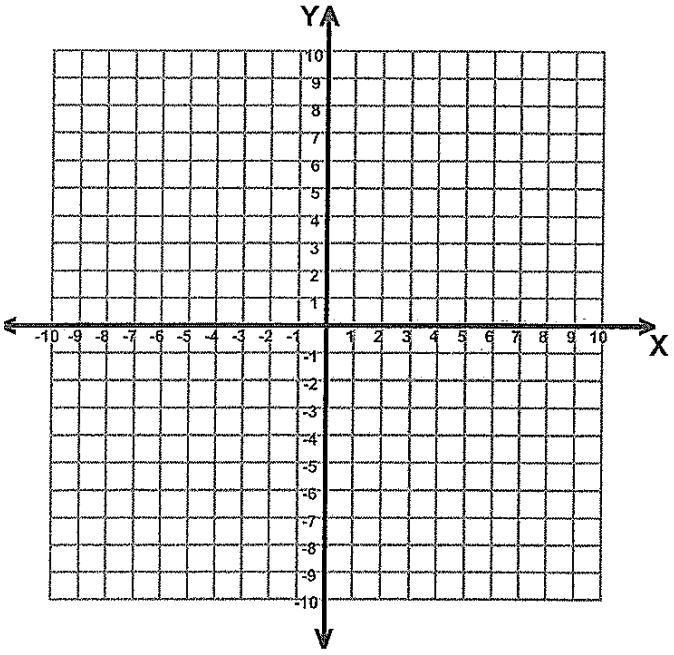
b) Draw the image of the polygon.

c) Label the polygon PQRS.

d) Reflect the rectangle PQRS over the y-axis.

e) Label the new rectangle P'Q'R'S'

P'( ), Q'( ), R'( ), S'( )



6) Point *A* is located at (4, -7). The point is reflected in the *x*-axis. Its image is located at

A) (-4, 7) B) (-4, -7) C) (4, 7) D) (7, -4)

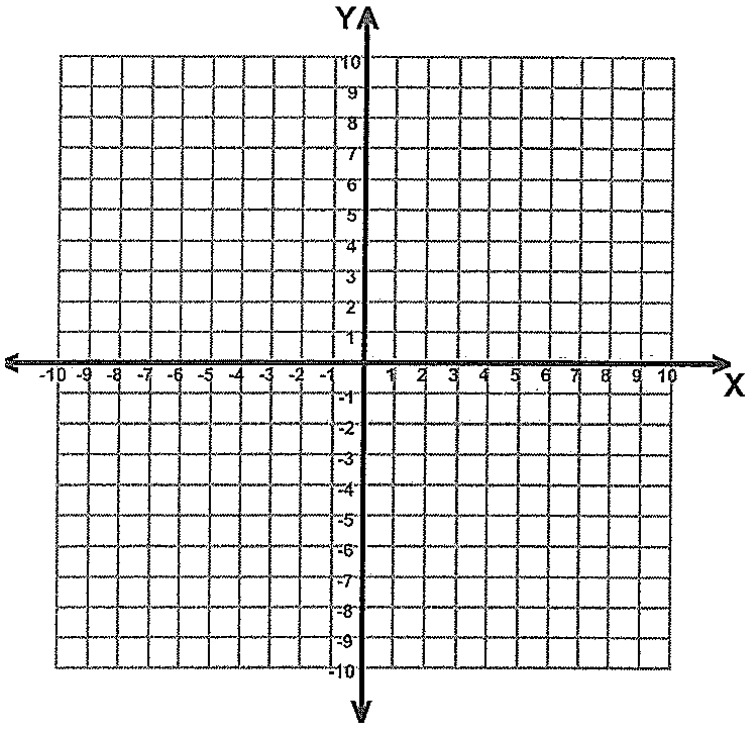
7) When the point (2, -5) is reflected in the *y*-axis, what are the coordinates of its image?

A) (2, 5) B) (-2, -5) C) (-2, 5) D) (-5, 2)

8) a) Plot the ordered pairs: A(-6,4), B (-3,6), C (-3,2), D(-6,2)

b) Translate one unit up and eight units right, and list the new coordinates.

c) Reflect A'B'C'D' in the *x*-axis and list the new coordinates.



9) What is the image of point (-3, 7) after a reflection in the *y*-axis?

A) (3, -7) B) (-3, -7) C) (3, 7) D) (7, -3)

10) What are the coordinates of point (2, -3) after it is reflected over the *x*-axis?

A) (2, 3) B) (-2, 3) C) (-2, -3) D) (-3, 2)

Review Work:

11)

x	y
1	4
2	8
3	12
4	16
5	20
10	

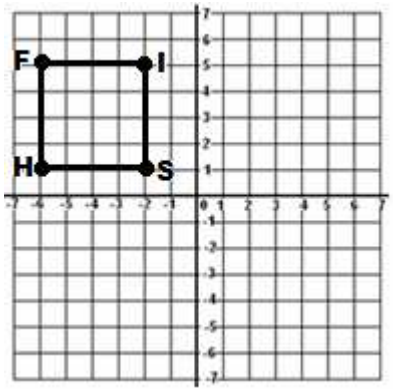
12)

x	2	4	6	8	10	50
y	8	12	16	20	24	

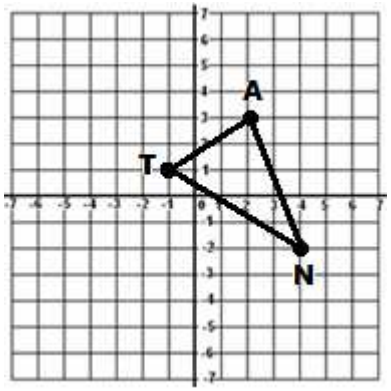
Lesson 3
Reflection
Other Types

Do Now: Review

1) Reflect in the *x*-axis and list the new coordinates:



2) Reflect in the *y*-axis and list the new coordinates:
Remember reflect the points and then connect the dots.



Transform the point below and write the new coordinates.

5) Translate the point (7, 2) 5 units down and 6 units to the left _____

6) Reflect the point (7, 2) over the x axis _____

7) Reflect the point (7, 2) over the y axis _____

Other types of Reflections:

1) **Coordinate Reflections in Vertical and Horizontal Lines**
2) **Reflection in the line $y = x$**
3) **Reflection in the line $y = -x$**
4) **Reflection in the Origin**

Words used to Reflect

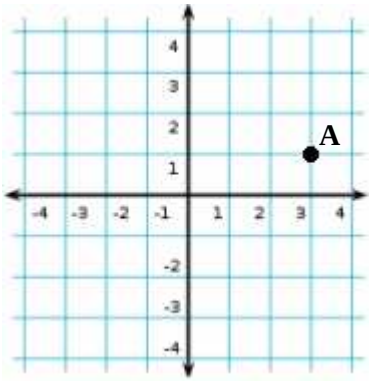
1) **Reflect over**
2) **Reflect in**
3) **Reflect thru**

Examples:

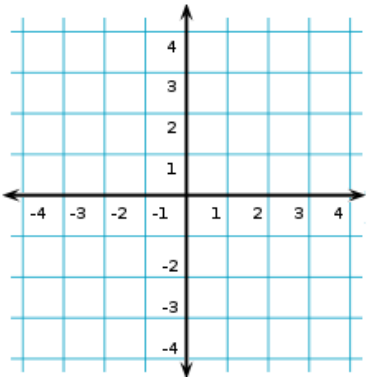
1) Coordinate Reflections in Vertical and Horizontal Lines

Step 1: Graph the line
Step 2: Plot the point
Step 3: Graph the reflection
Step 4: Write down the new coordinates

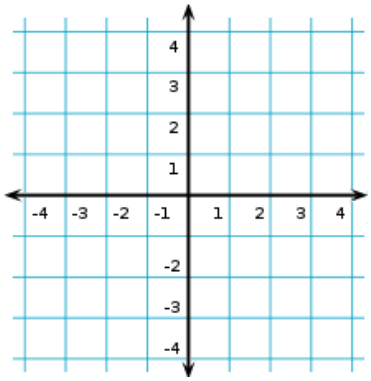
A) Reflect the point (3, 1) over the line $y = 2$



B) Reflect the point (-2,1) over the line x = 1



C) Reflect the point (-2, -3) over the line $y = -1$

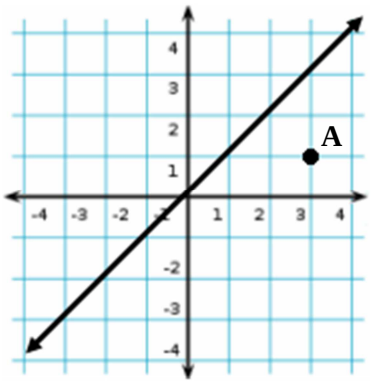


---

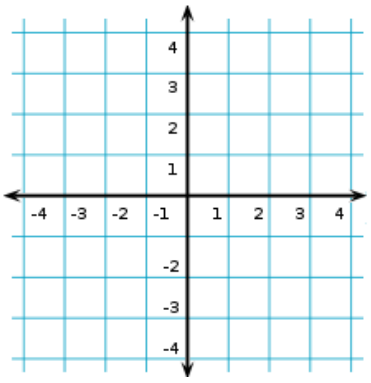
2) Reflection in the line $y = x$

Step 1: Graph the line
Step 2: Plot the point
Step 3: Graph the reflection
Step 4: Write down the new coordinates

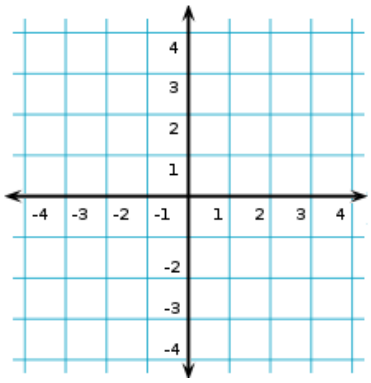
A) Reflect the point (3,1) in the line $y = x$



B) Reflect the point (-2,1) in the line $y = x$



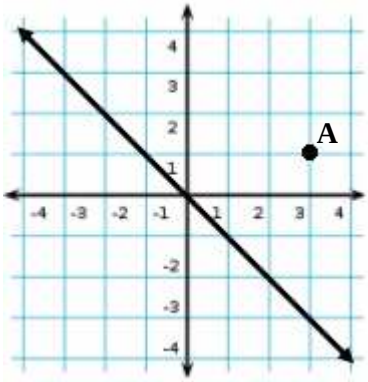
C) Reflect the point (-2, -3) in the line $y = x$



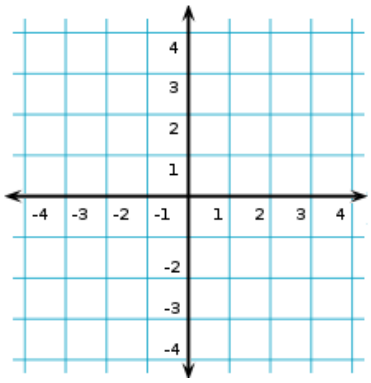
3) Reflection in the line $y = -x$

Step 1: Graph the line
Step 2: Plot the point
Step 3: Graph the reflection
Step 4: Write down the new coordinates

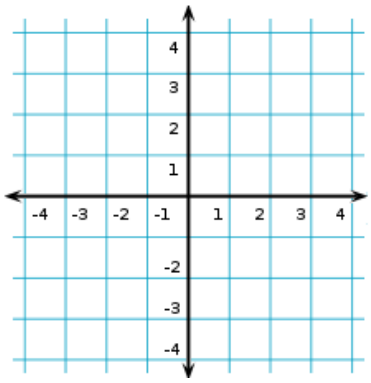
A) Reflect the point (3,1) in the line $y = -x$



B) Reflect the point (-2,1) in the line $y = -x$



C) Reflect the point (-2, -3) in the line $y = -x$

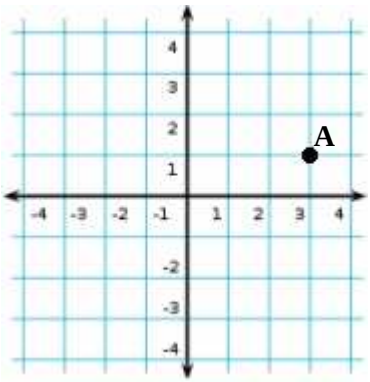


---

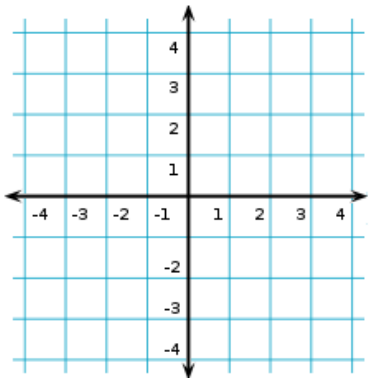
4) Reflection in the Origin

Step 1: Plot the point
Step 2: Write the point
Step 3: Change both signs and write the new coordinates
Step 4: Plot the new point

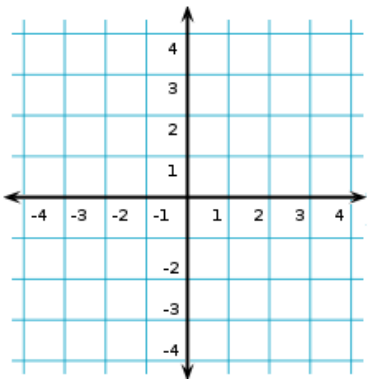
A) Reflect the point (3,1) through the Origin



B) Reflect the point (-2,1) about the Origin

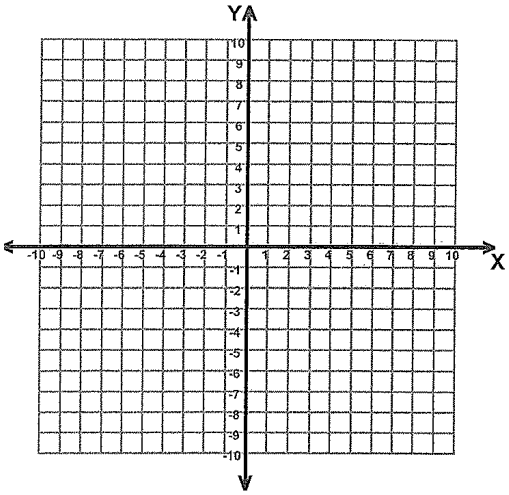


C) Reflect the point (-2, -3) through the Origin

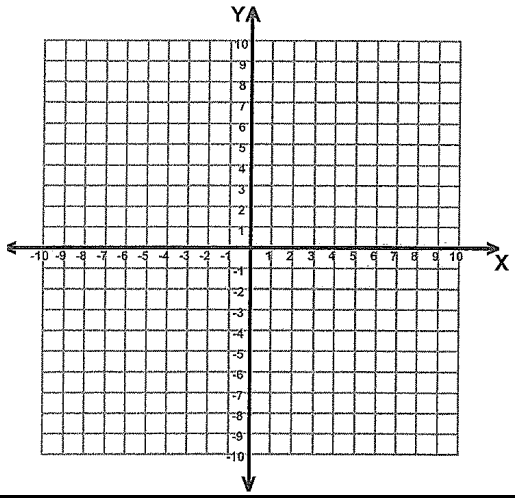


Try These:

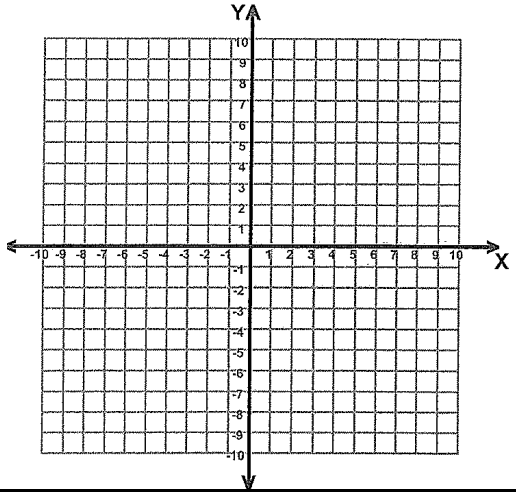
1) Reflect the point (-3, 2) over y = 4



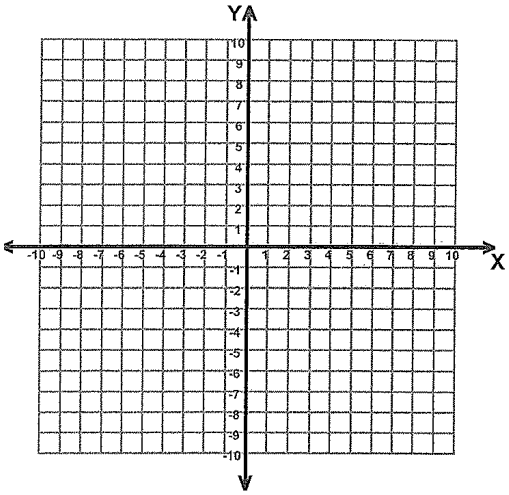
2) Reflect the point (5, 8) over x = 4



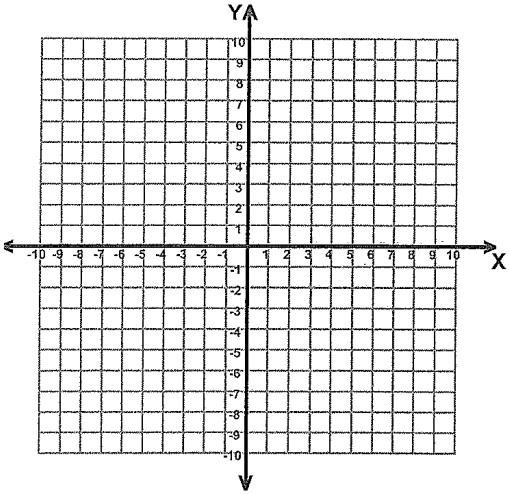
3) Reflect the point (3, 7) over the line $y = x$



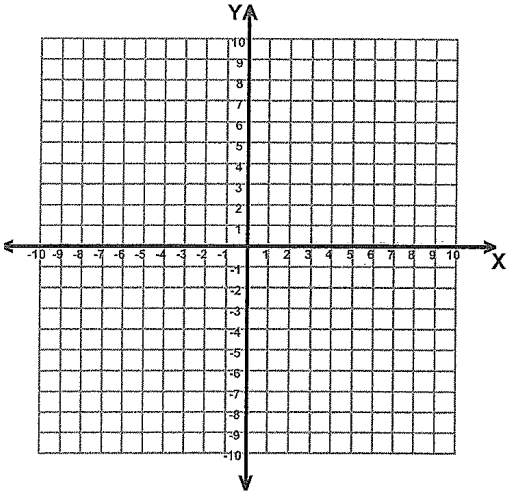
4) Reflect the point (3, -8) over the line $y = -x$



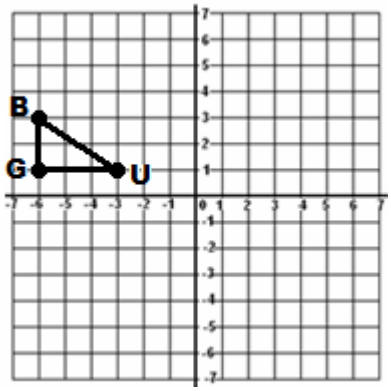
5) Reflect the point (-2, -3) over the Origin



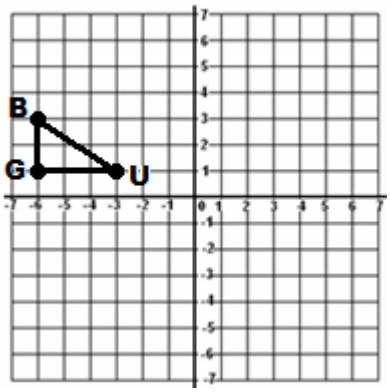
6) Reflect the point (4, 5) over the Origin



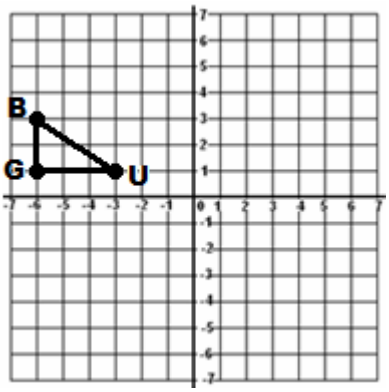
7) Reflect BUG through the line $y = x$ and list the new coordinates.



8) Reflect BUG through the line $y = -x$ and list the new coordinates.

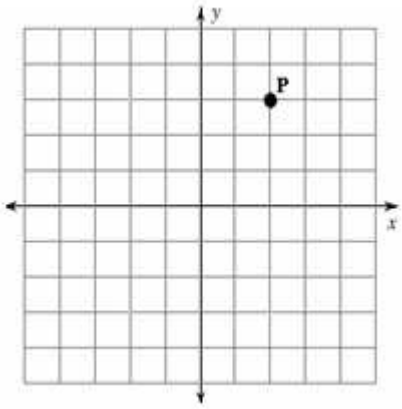


9) Reflect BUG through the origin and list the new coordinates.



Lesson 3: Classwork/Homework

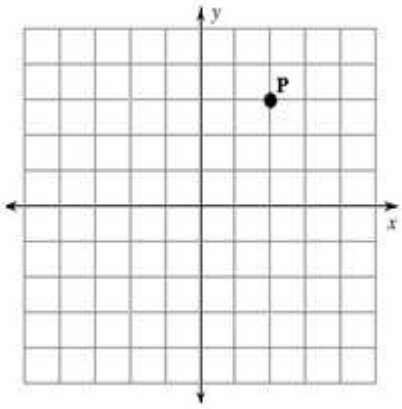
Given point P in the graph:



1) Plot P' after a reflection of P in $y = x$

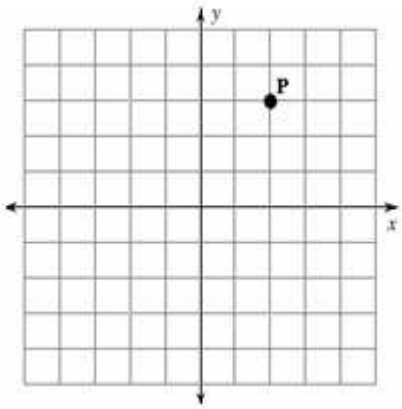
2) What are the new coordinates?

Given point P in the graph:



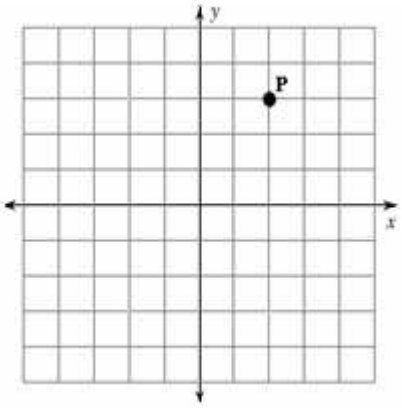
3) Plot P' after a reflection of P in $y = -x$

4) What are the new coordinates?



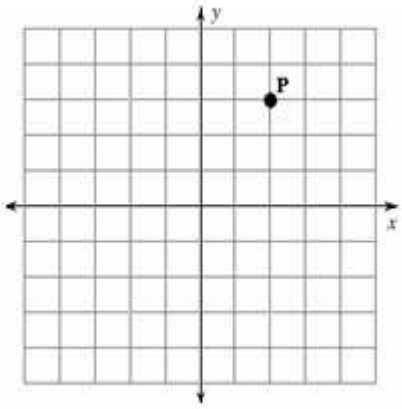
5) Plot P' after a reflection of P in the origin.

6) What are the new coordinates?



7) Plot P' after a reflection of P over the line $y = 1$

8) What are the new coordinates?



9) Plot P' after a reflection of P over the line $x = -1$

10) What are the new coordinates?

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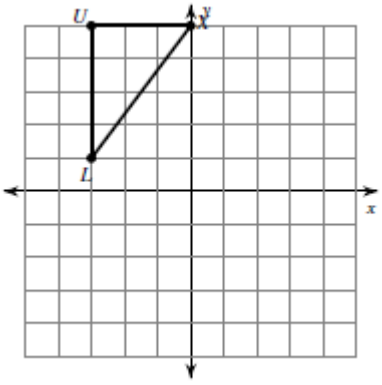
11) A) Graph the image after a reflection across the line $y = x$. B) List the new coordinates:



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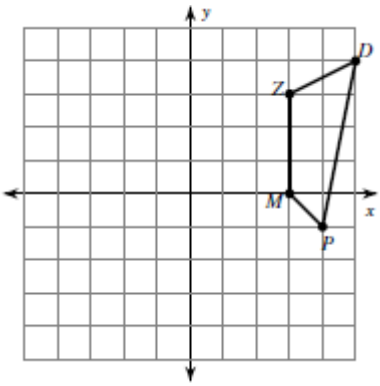
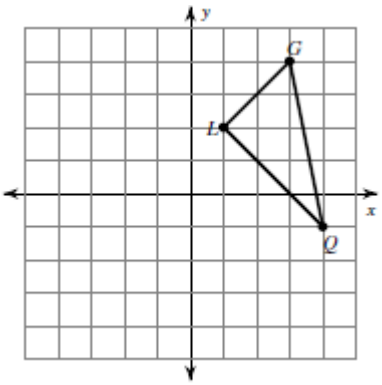
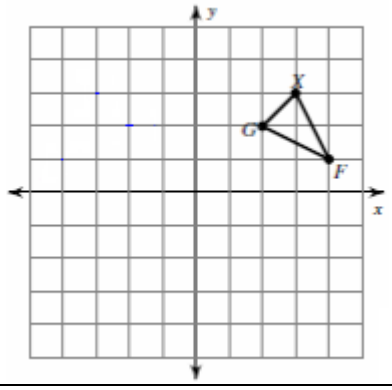
12) A) Reflect the quadrilateral over the line $y = -x$. B) List the new coordinates:



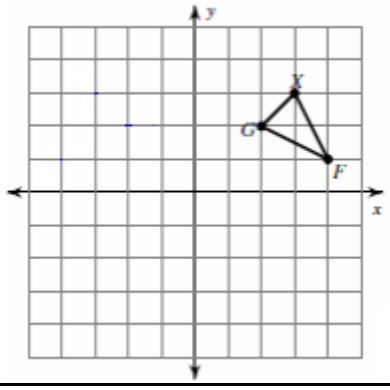
13) A) Graph the image after a reflection through the origin. B) List the new coordinates:



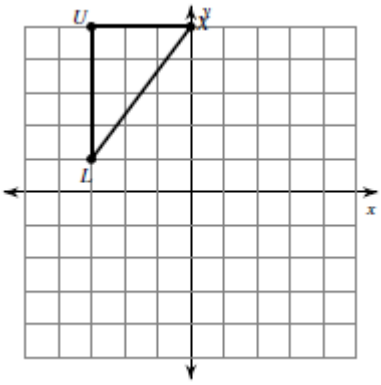
14) A) Graph the image after a reflection in the *y*-axis B) List the new coordinates.



15) A) Graph the image after a reflection through the line $x = 1$ B) List the new coordinates.



16) A) Graph the image after a reflection across the x axis. B) List the new coordinates:



Lesson 4
Rotations

Another type of **transformation** is a **rotation**.

A **rotation** would also be considered a **turn**.

In a **rotation,** the **location** and **orientation** change, however the **size** remains the same.

A figure and its rotation are _____.

Vocabulary: Understanding Rotations

We all know Pro Skateboarder Tony Hawk 360 degrees trick is one complete turn. Therefore:

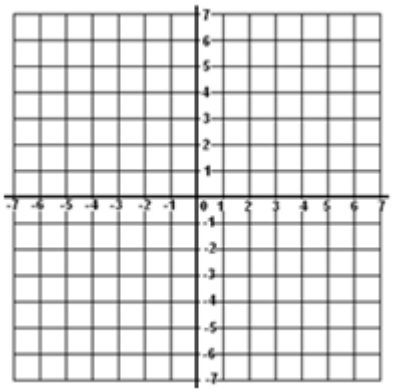
a) 1/4 turn = _____ b) 1/2 turn = _____ c) 3/4 turn = _____

Clockwise - _____

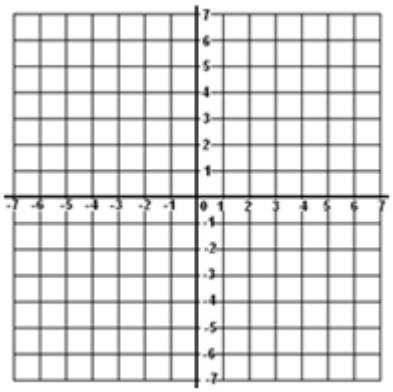
Counter Clockwise - _____

Examples:

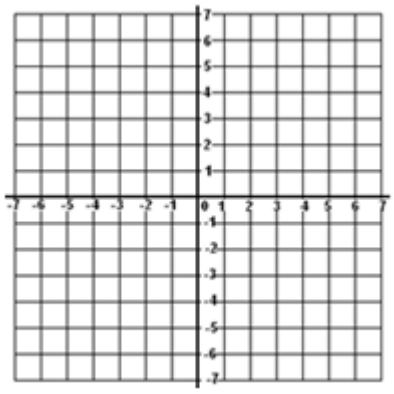
1) Plot Point A (4, 5), Rotate 90 degrees clockwise and list the new coordinates _____



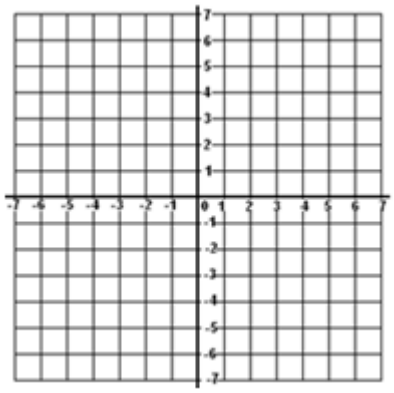
2) Plot Point B (4, 5), Rotate 180 degrees clockwise and list the new coordinates _____



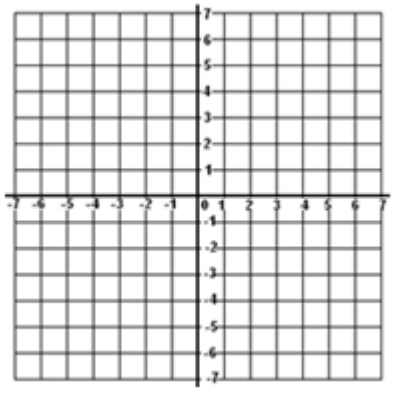
3) Plot Point C (4, 5), Rotate 270 degrees clockwise and list the new coordinates _____



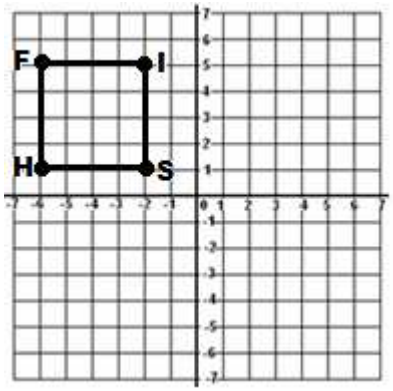
4) Plot Point D (4, 5), Rotate 90 degrees counter clockwise and list the new coordinates _____



5) Plot Point E (4, 5), Rotate 270 degrees counter clockwise and list the new coordinates _____



6) Rotate 90° clockwise and list the new coordinates _____



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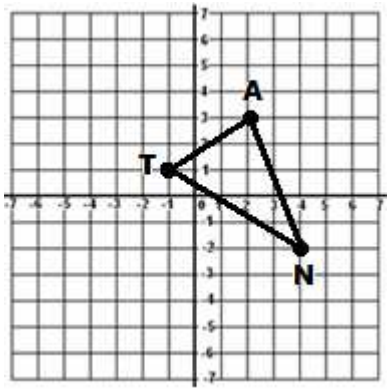
7) Rotate 180° clockwise and list the new coordinates _____



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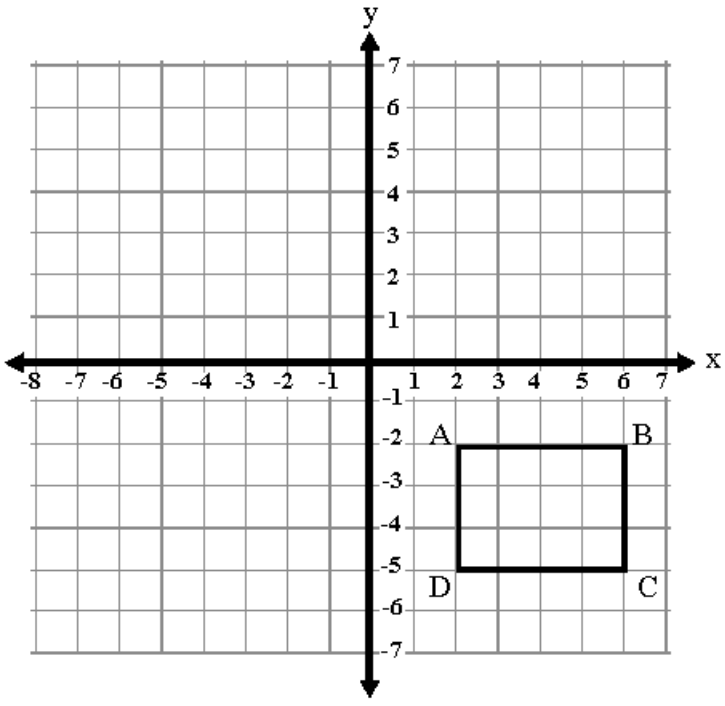
8) A 270° clockwise rotation is the same as what other rotation?

Try These:

1) Sarah drew a rectangle on the grid to the right. On the same grid rotate the original rectangle about the origin:

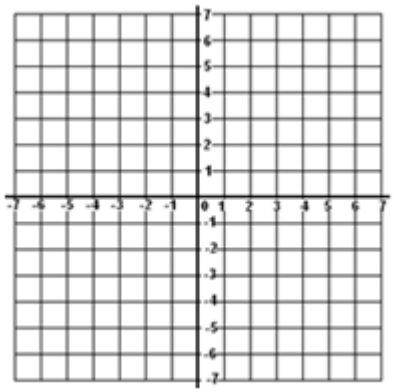
a) 90 degrees clockwise and label the new points A'B'C'D'

b) 180 degrees clockwise and label the new points A"B"C"D"

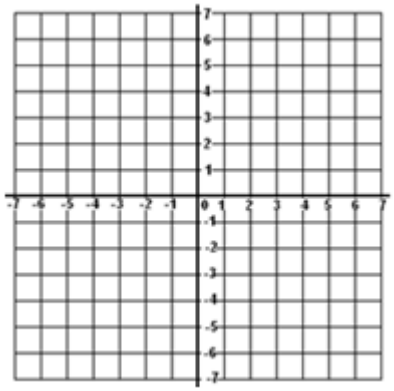


Lesson 4: Classwork/Homework

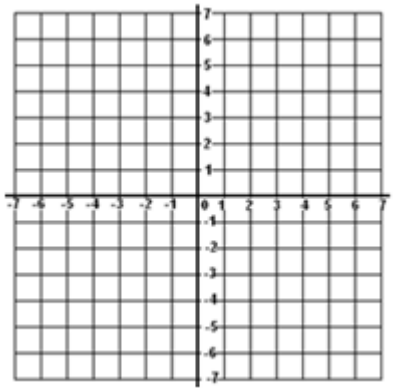
1) Plot Point A (2, -3), Rotate 90 degrees clockwise and list the new coordinates _____



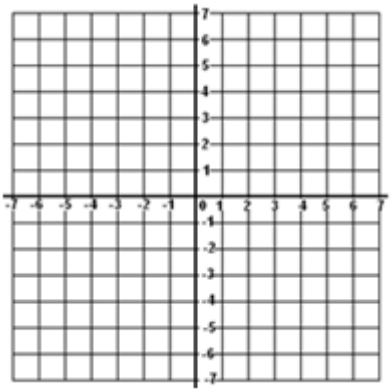
2) Plot Point B (2, -3), Rotate 180 degrees clockwise and list the new coordinates _____



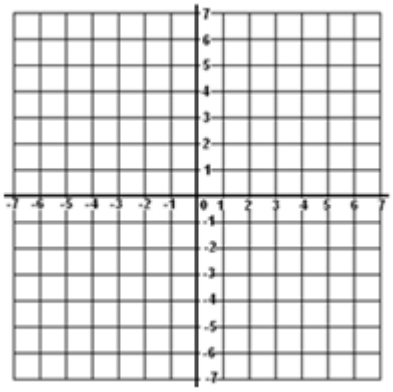
3) Plot Point C (-3, -5), Rotate 270 degrees clockwise and list the new coordinates _____



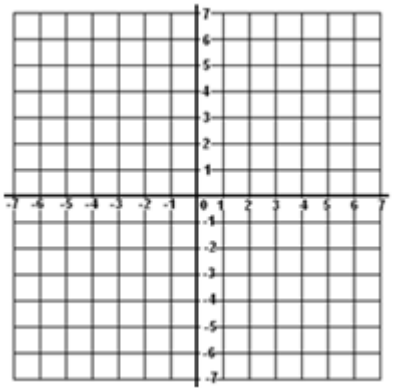
4) Plot Point D (-3, -5), Rotate 90 degrees counter clockwise and list the new coordinates _____



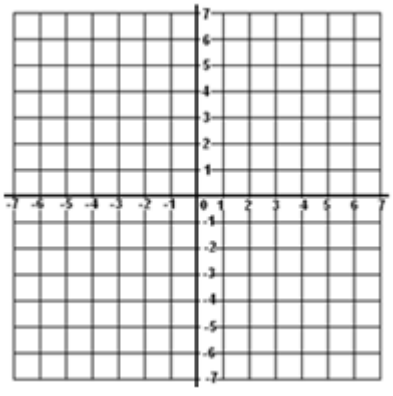
5) Plot Point E (-2, 4), Rotate 270 degrees counter clockwise and list the new coordinates _____



6) Plot Points A (-5,5), B (-2,5), C (-5,2), and D (-2,2) , Rotate 90° clockwise and list the new coordinates and plot new points.

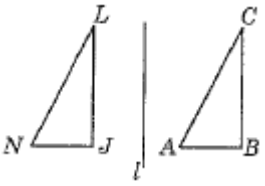


7) Plot Points A (1,3), B (3,1) and C (2,0), Rotate 270° clockwise. What are the coordinates of B' _____

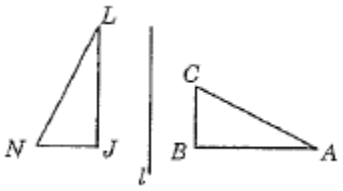


8) In which figure is triangle NJL a rotation of triangle ABC?

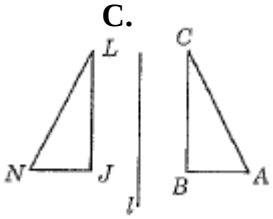
A.



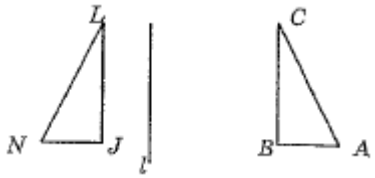
B.



C.

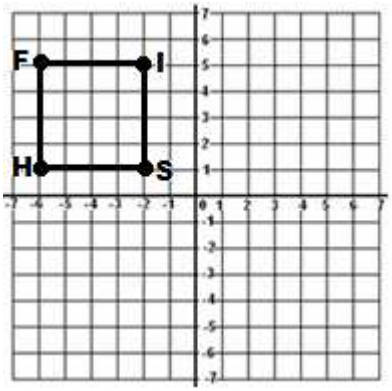


D.

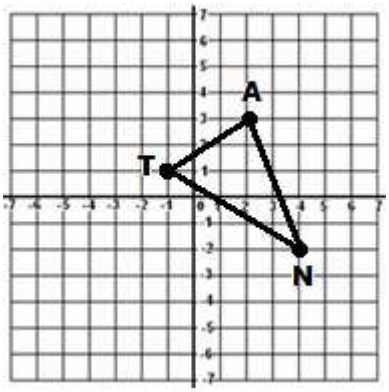


Review Work:

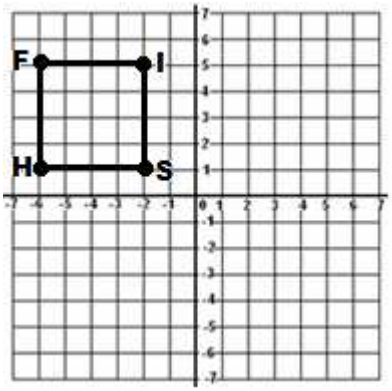
9) Reflect in the *y*-axis and list the new coordinates:



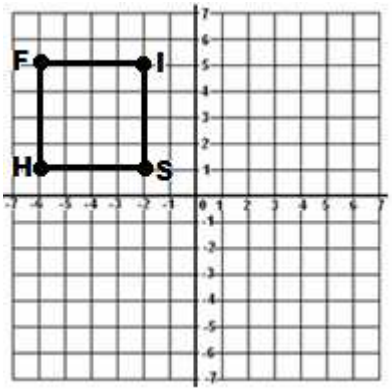
10) Reflect in the *x*-axis and list the new coordinates:
Remember reflect the points and then connect the dots.



11) Translate 8 units right and 7 units down



12) Graph the image after a reflection through the origin.



Lesson 5
Dilations

Another type of **transformation** is a **dilation**.

A **dilation** would involve **enlarging** or **shrinking** an object. A real life example of this would be enlarging or shrinking a photograph. It still has the **same shape** and the **same orientation**, however the **size** has changed. A figure and its dilation are similar.

Similar – same shape different size. (~) Corresponding angles are equal in measure.
Corresponding sides form a proportion.

The constant of dilation, called k, determines the images reduction or enlargement.

If	$0 < k < 1$	then the image is a reduction of the original figure
If	$k = 1$	then the image is congruent to the original figure
If	$k > 1$	then the image is an enlargement of the original figure

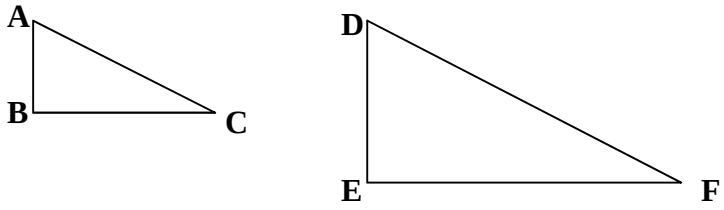
Examples:
Determine whether the dilation with the given constant of dilation results in a reduction or an enlargement of the original.

1) $k = 3$ 2) $k = 2/3$ 3) $k = 1$ 4) $k = 1.5$

5) If you use a 2 x 3 photo as the original and a 8 x 12 as the enlargement, find the constant of dilation.

Comparing corresponding parts of the similar triangles:

Rule: Corresponding angles are equal in measure
Corresponding sides form a proportion.



6) Comparing corresponding angles

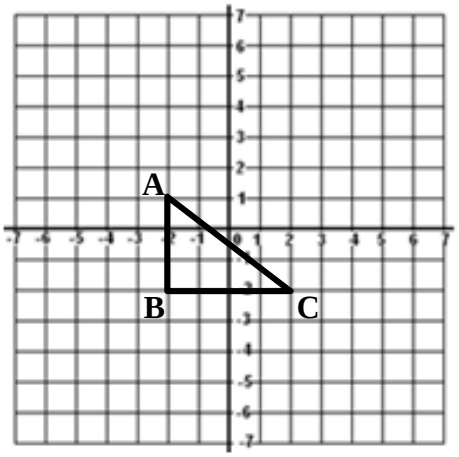
$< A \cong <$ $< B \cong <$ $< C \cong <$

7) Comparing corresponding sides

$\overline{AB} = \overline{BC}$ $\overline{AB} = \overline{AC}$ $\overline{BC} = \overline{AC}$

8) Draw the image of the triangle after a dilation of 3

Current points: A ( ) New points: A' ( )
B ( ) B' ( )
C ( ) C' ( )



9) List the 3 pairs of corresponding angles

10) Determine and Label the distance of sides $\overline{AB}$, $\overline{A'B'}$, $\overline{BC}$, $\overline{B'C'}$

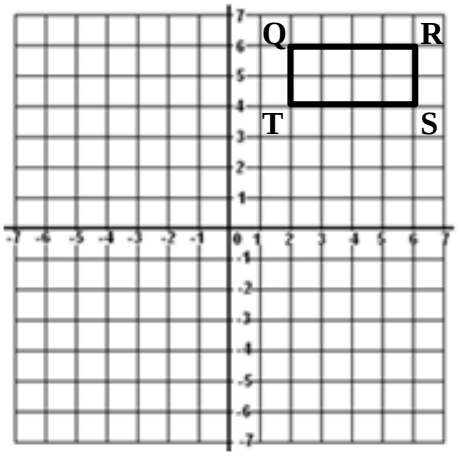
11) Write a proportion for the sides and determine if they are similar triangles

---

12) Draw the image of the rectangle after a dilation of 1/2

Current points: Q ( ) R ( )
S ( ) T ( )

New points: Q'( ) R'( )
S' ( ) T'( )

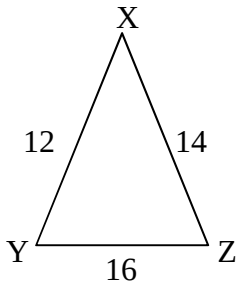


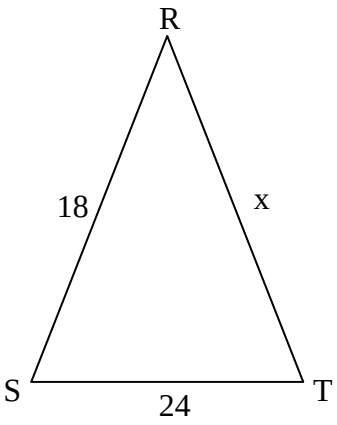
13) List the 4 pairs of corresponding angles

14) Determine and Label the distance of sides all 8 sides (on the graph)

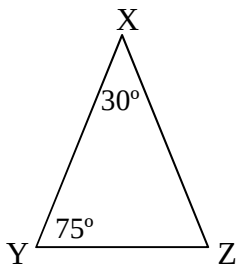
15) Write a proportion for the sides proving the rectangles are similar.

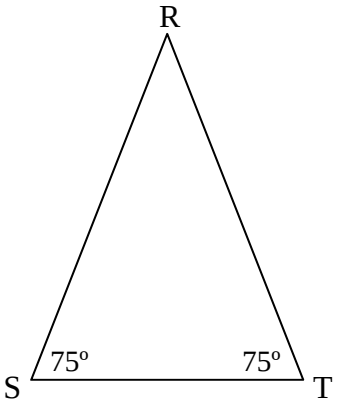
16) **Δ XYZ ~ Δ RST** find x





Δ XYZ ~ Δ RST





17) What is the measure of < Z

18) What is the measure of < R

Try These:

1) Determine whether the dilation with the given constant of dilations results in a reduction or an enlargement of an image congruent to the original.

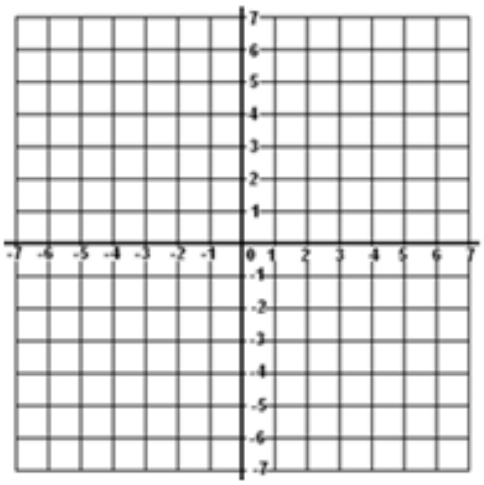
a) k = 2 b) k = $\frac{1}{4}$ c) k = 4 d) k = .5

---

2) a) Plot the ordered pairs:
P (-2,-1), Q (-2,3), R (3,0)

b) Draw the image of the polygon and label.

c) Draw a new polygon P'Q'R' with a constant dilation of 2.



3) What are the new points after a dilation of $\frac{1}{2}$?

A (-6,-2), B (-6,-6), C (-4,-2), D (-4,-6)

A'( ), B'( ), C'( ), D'( )

---

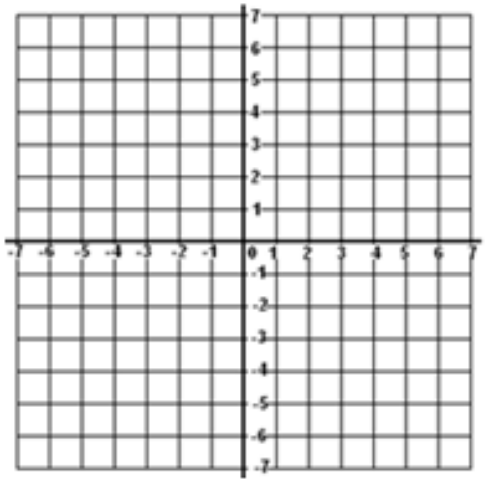
4) If you use a 4 x 5 photo as the original and a 12 x 15 as the enlargement, find the constant dilation.

---

5) a) Draw a rectangle with the following coordinates:

W(-3,3), X (-3,6), Y (3,6), Z (3,3)

b) Draw a new image with a constant dilation of $\frac{1}{3}$.



Lesson 5: Classwork/Homework

If A (2, 4), B (6, 2) and C (8, 10), state the coordinates of their images after the following dilations:

1) $(x, y) \rightarrow (4x, 4y)$ _____

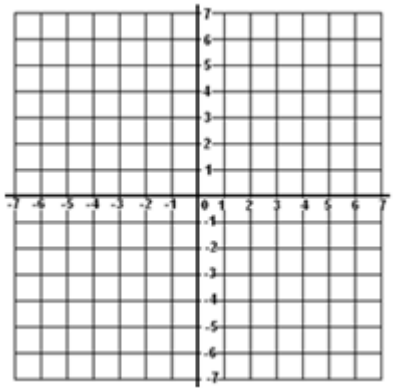
2) D_2 _____

3) scale factor of ½ _____

---

4) A) Plot points A (-2, 3), B (1, 3), C (0, -1), and D (-3, -1)

B) Dilate $(x, y) \rightarrow (2x, 2y)$ and list the new coordinates.



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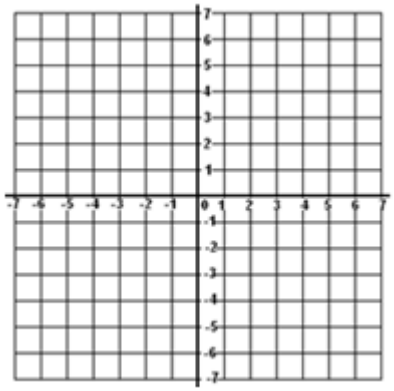
5) A) Plot points Q (1, 2), R (2, 1) and S (-2, 0)

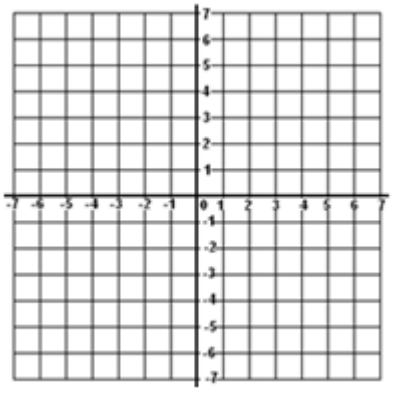
B) Dilate D_3 and list the new coordinates.



---

6) A) Plot Points A (-6 ,4), B (-2 ,6), C (-2 ,2), and D (-6, 2)

B) Dilate by a scale factor of $\frac{1}{2}$, and list the new coordinates.

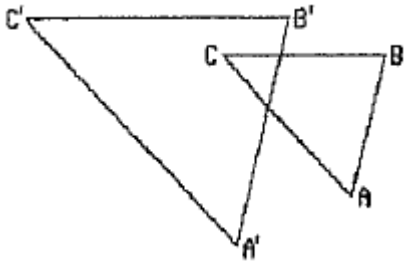


7) Which transformation for letter M is shown in the diagram to the right?

A) line reflection B) transformation
C) rotation D0 dilation

---

8) In the diagram, ΔABC is similar to but *not* congruent to $\Delta A'B'C'$. Which transformation is represented by $\Delta A'B'C'$?



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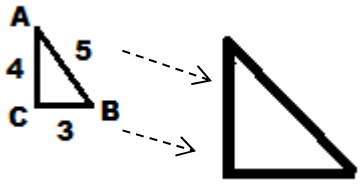
9) Given the following dilation of 2, label all parts of the dilated triangle.



Review Work:

10) Determine the number of solutions BY INSPECTION. (Be sure to put both line in the same form)

$y = -3x + 2$ $3x + y = 5$

---

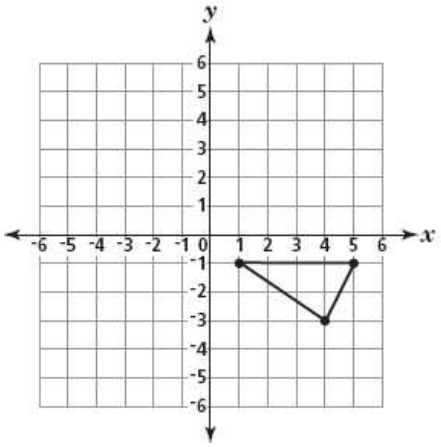
11) Convert 81°F into Celsius

$C = \frac{5}{9}(F - 32)$

Lesson 6
Mixed Review

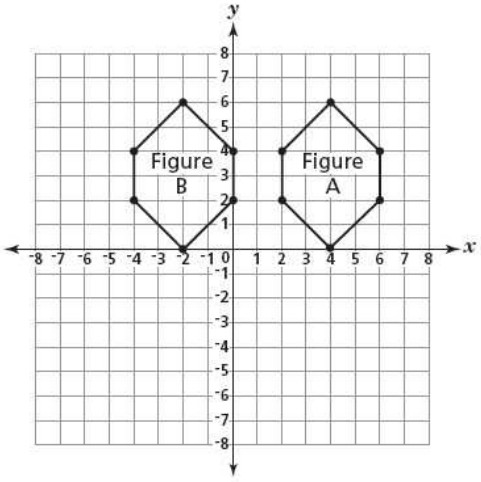
Lesson 6: Classwork

1) Gary drew a triangle on the coordinate grid shown below.
If Gary reflects the triangle in the y-axis, what will be the new coordinates of the vertices of the triangle?



A) (–1, –1), (4, –3), (–5, 1)
B) (–1, –1), (–4, –3), (–5, –1)
C) (–1, 1), (–4, 3), (5, –1)
D) (1, 1), (4, 3), (5, 1)

2) Ana drew two figures on the coordinate grid shown below.
Which transformation did Ana apply to Figure A to get Figure B ?



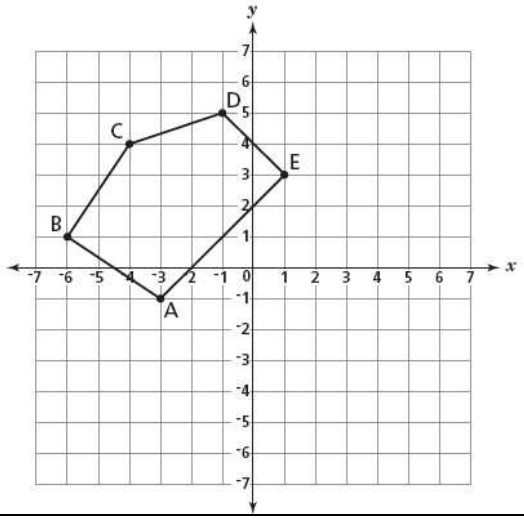
A) rotated 90°
B) dilated by 6
C) reflected in the y-axis
D) translated 6 units to the left

3) Pentagon ABCDE is drawn on the grid below. On the grid, draw a translation of pentagon ABCDE five units down.

Be sure to

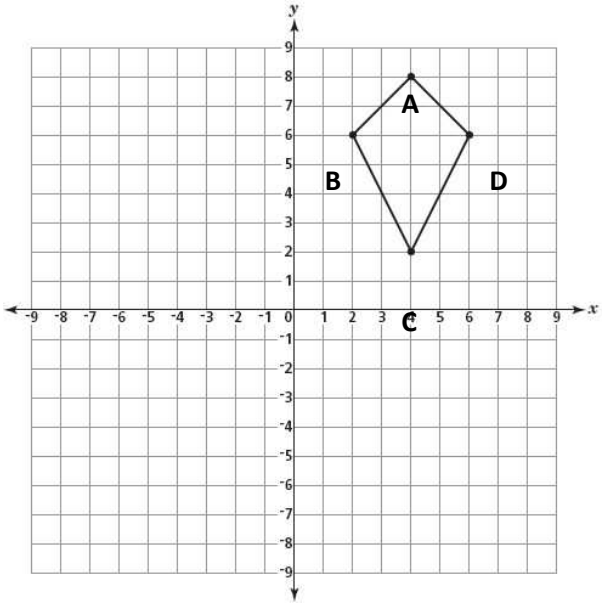
- draw the translated shape
- label the translated pentagon A'B'C'D'E'

What are the coordinates for point A'?

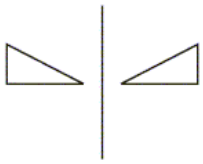


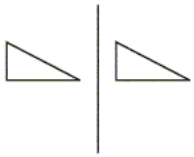
4) Melissa drew the shape on the grid shown below. Draw the reflection of this shape in the *x*-axis. Label the coordinates of each point on the new figure.

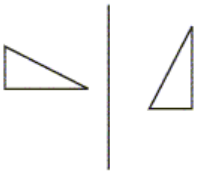
Explain how you determined the reflection of the shape.

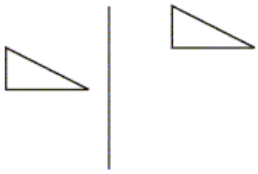


5) Which figure below shows a reflection?

A. 

B. 

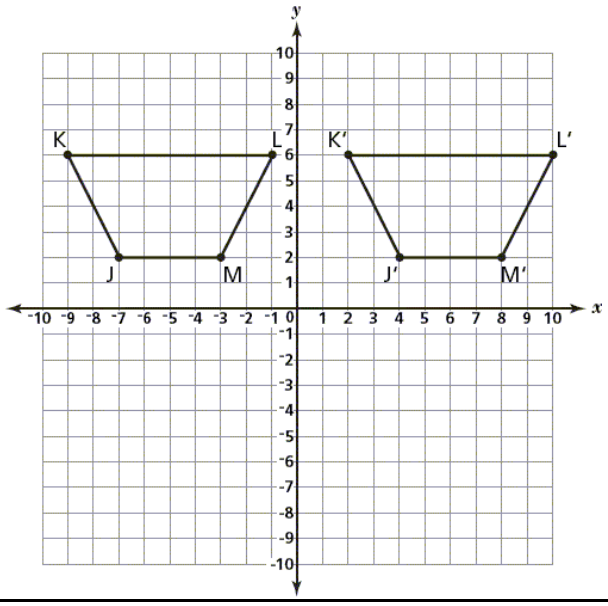
C. 

D. 

6) Trapezoid JKLM and its transformation trapezoid J'K'L'M' are plotted on the grid below.

A) Name the transformation that was applied to trapezoid JKLM to get trapezoid J'K'L'M'.

B) Explain how you determined what transformation was applied to trapezoid JKLM to get trapezoid J'K'L'M'.



7) Which transformation does *not* always produce an image that is congruent to the original figure?

A) translation

C) rotation

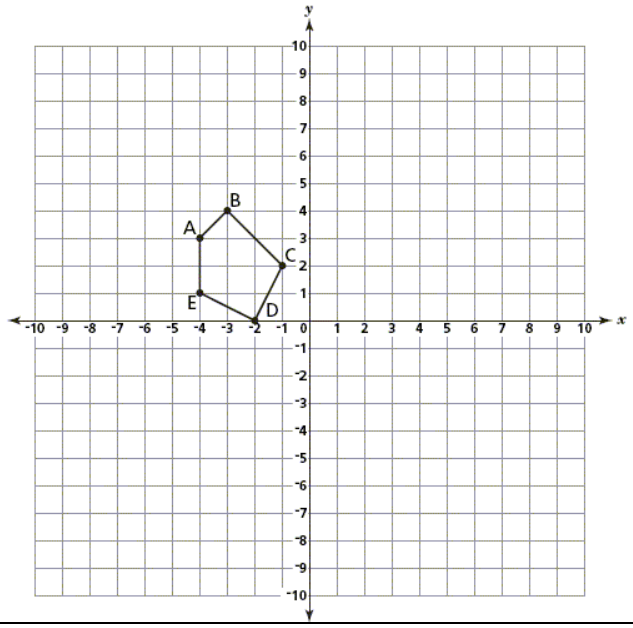
B) dilation

D) reflection

8) Pentagon ABCDE is plotted on the grid below.

A) On the grid, draw the translation of pentagon ABCDE five units to the right and three units down. Label the translated figure A'B'C'D'E'.

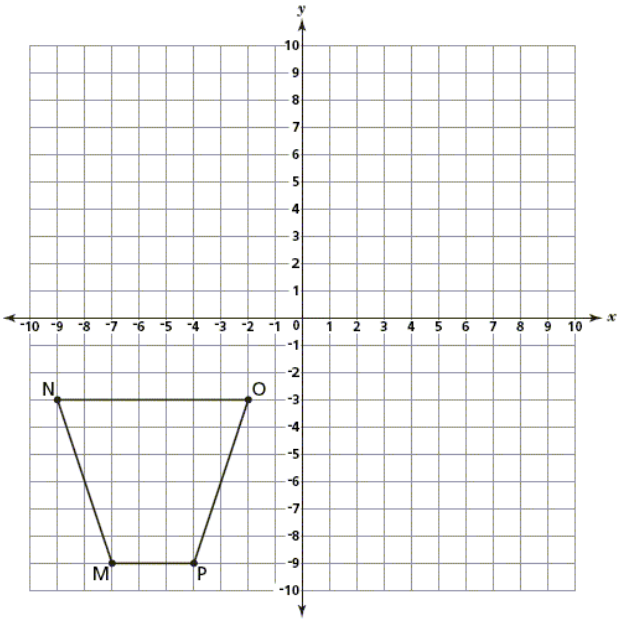
B) Explain how you determined the location of A'.



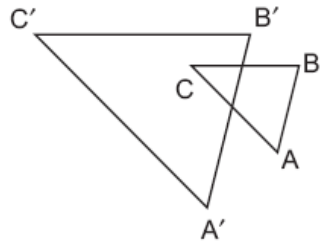
9) Trapezoid MNOP is plotted on the grid below.

A) On the grid, draw the image of trapezoid MNOP after a reflection over the y -axis. Label the new trapezoid M'N'O'P'.

B) Explain how you determined the location of point M'.



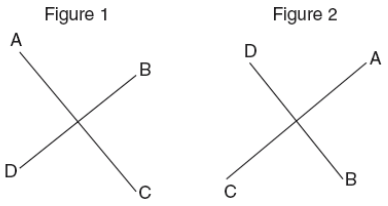
10) In the accompanying diagram, ΔABC is similar to but not congruent to $\Delta A'B'C'$.



Which transformation is represented by $\Delta A'B'C'$?

A) rotation
B) translation
C) reflection
D) dilation

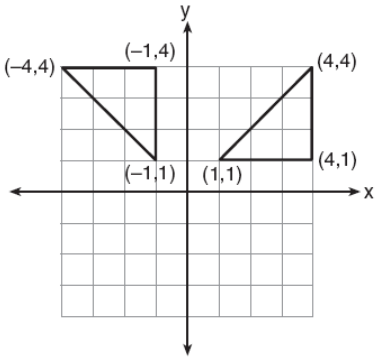
11) The accompanying diagram shows a transformation.



Which transformation performed on figure 1 resulted in figure 2?

A) rotation
B) reflection
C) dilation
D) translation

12) Which type of transformation is illustrated in the accompanying diagram?



A) dilation
B) reflection
C) translation
D) rotation

13) What is the image of (x,y) after a translation of 3 units right and 7 units down?

A) $(x + 3, y – 7)$
B) $(x + 3, y + 7)$
C) $(x – 3, y – 7)$
D) $(x – 3, y + 7)$

14) What is the image of point (2,5) under the translation that shifts (x,y) to $(x + 3, y – 2)$?

A) (0,3)
B) (0,8)
C) (5,3)
D) (5,8)

15) What are the coordinates of P', the image of P (–4, 0) under the translation $(x – 3, y + 6)$?

A) (–7,6)
B) (7,–6)
C) (1,6)
D) (2,–3)

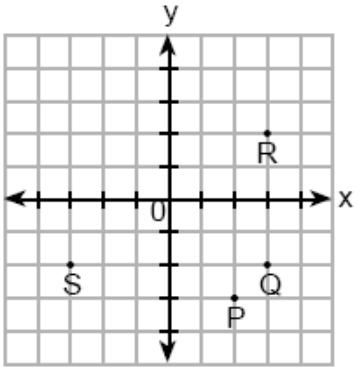
16) A translation moves $P(3,5)$ to $P'(6,1)$. What are the coordinates of the image of point (–3,–5) under the same translation?

A) (0,–9)
B) (–5,–3)
C) (–6,–1)
D) (–6,–9)

17) What is the image of point (–3,–1) under a reflection in the origin?

A) (3,1)
B) (–3,1)
C) (1,3)
D) (–1,–3)

18) If $x = –3$ and $y = 2$, which point on the accompanying graph represents $(–x,–y)$?



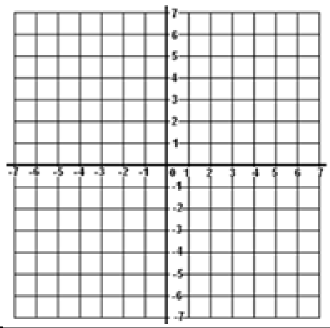
Lesson 6: Homework

1) If the letter  is rotated 180 degrees, which is the resulting figure?

A)  B)  C)  D) 

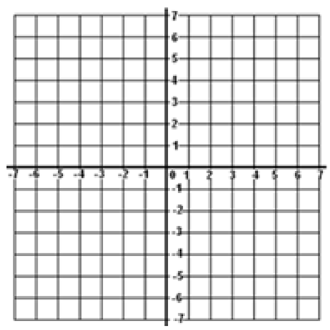
2) If point (5,2) is rotated counterclockwise 90° about the origin, its image will be point

A) (2, 5)
B) (2, -5)
C) (-2, 5)
D) (-5, -2)



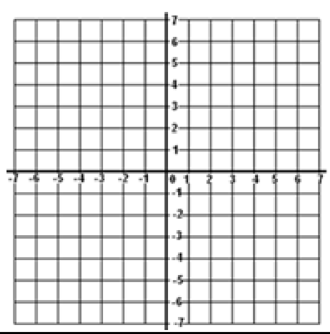
3) Point *A* is located at(4, -7). The point is reflected in the *x*-axis. Its image is located at

A) (-4, 7)
B) (-4, -7)
C) (4, 7)
D) (7, -4)



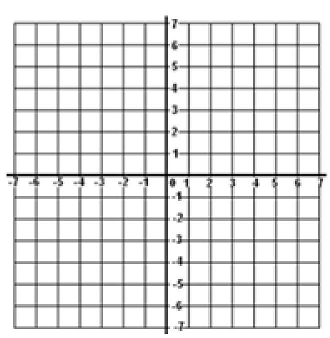
4) What are the coordinates of point *P*, the image of point (3, -4) after a reflection in the line $y = x$?

A) (3, 4)
B) (-3, 4)
C) (4, -3)
D) (-4, 3)

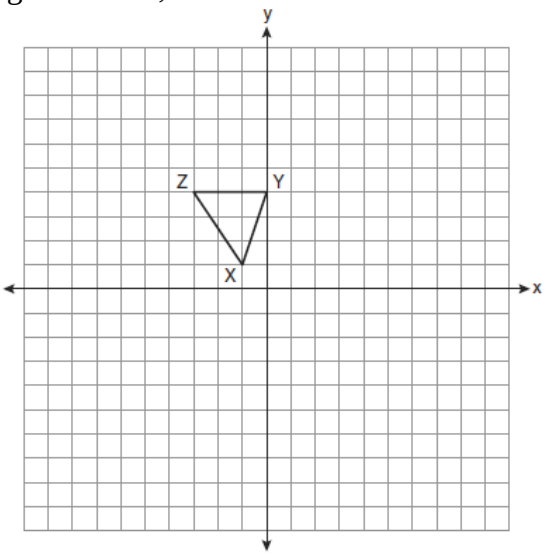


5) What is the image of point (-3, -1) under a reflection in the origin?

A) (3, 1)
B) (-3, 1)
C) (1, 3)
D) (-1, -3)



6) Triangle *XYZ*, shown in the diagram below, is reflected over the line $x = 2$. State the coordinates of $\triangle X'Y'Z'$, the image of $\triangle XYZ$.



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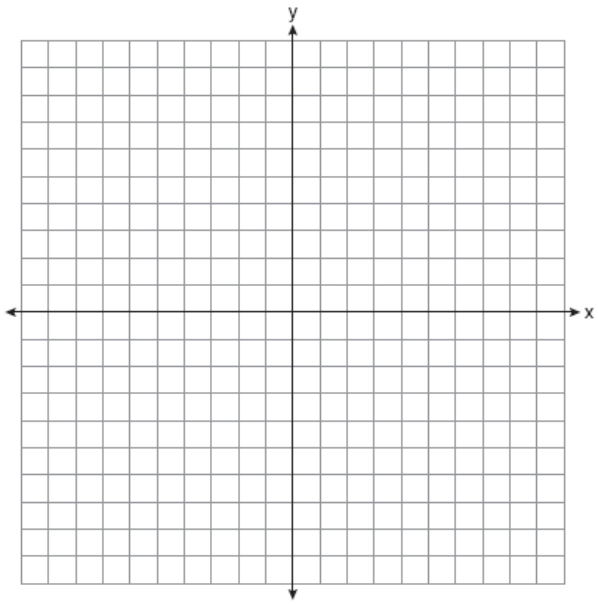
7) Triangle *TAP* has coordinates $T(-1,4)$, $A(2,4)$, and $P(2,0)$. On the set of axes below, graph and label $\triangle T'A'P'$, the image of $\triangle TAP$ after the translation $(x,y) \rightarrow (x-5, y-1)$.



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8) Under a dilation with respect to the origin, the image of $P(-15,6)$ is $P'(-5,2)$. What is the constant of dilation?

A) -4 B) 1/3 C) 3 D) 10

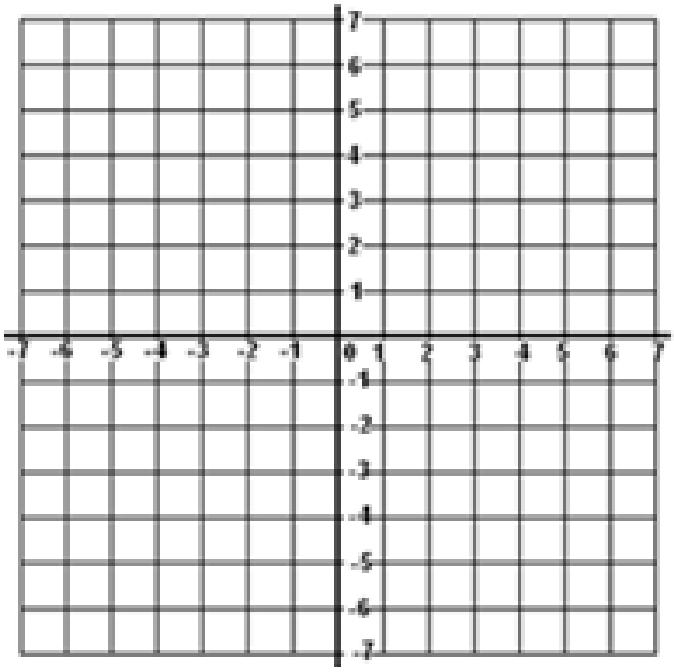
Lesson 7
Double Transformations

Vocabulary: Write a word that describes each transformation

1) Translation -_____
2) Reflection - _____
3) Rotation - _____
4) Dilation - _____

Examples:

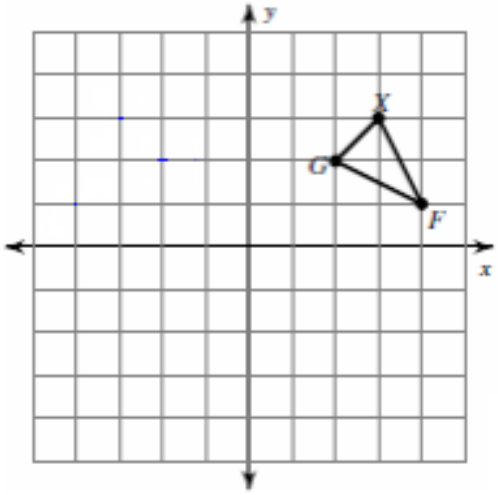
1) A) Plot Points A (2, 2), B (6, 2), and C (4, 5)



B) Reflect it through the *x*-axis and list the new coordinates below.

C) Reflect that image through the y-axis and list the new coordinates below.

2) A) Graph the image after a reflection in the *y*-axis and list the new coordinates.



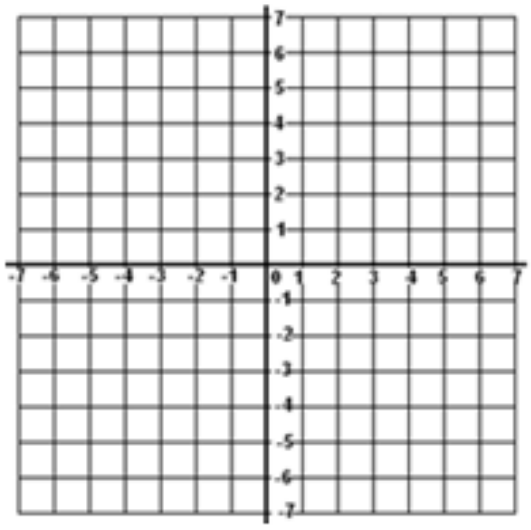
B) Then reflect that image through the line $y = -1$ and list the new coordinates.

Try These:

1) A) Graph Point A (-6, 4)

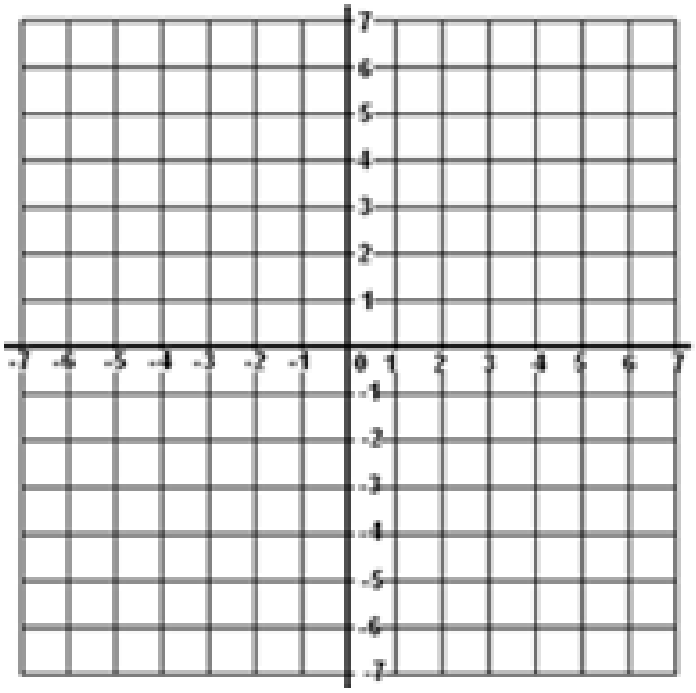
B) Translate it one unit up and eight units right

C) Then Reflect it in the *x*-axis



D) What is the new coordinate? _____

Just for Fun!



A) Plot Point (2,5)

B) Reflect in the *x*-axis

C) Reflect in the *y*-axis

D) Reflect over the line $y = -2$

E) Reflect over the line $x = -3$

F) Reflect over the line $y = x$

G) Reflect over the line $y = -x$

H) Reflect the origin

I) Translation $(x, y) \rightarrow (x + 2, y + 4)$

J) Translation 1 unit left and 4 units down

K) $T_{-2,3}$

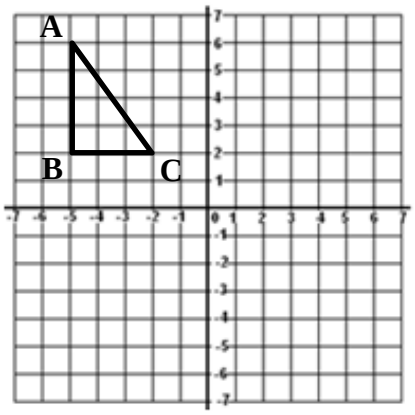
L) 90° clockwise rotation

M) 180° counterclockwise rotation

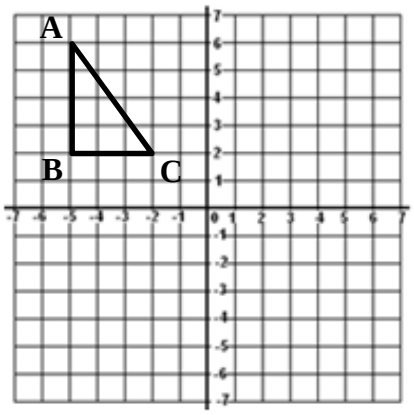
What are the coordinates of the Point M? _____

Lesson 7: Classwork/Homework

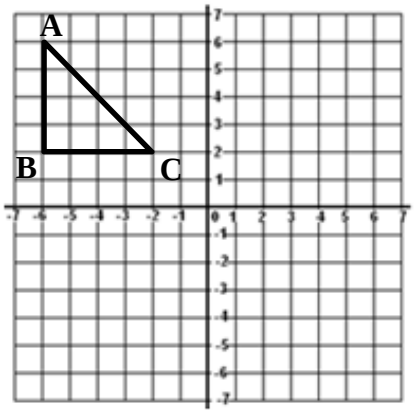
1) A. Reflect Triangle ABC in the *x*-axis.
B. Translate the image $(x, y) \rightarrow (x + 5, y + 3)$



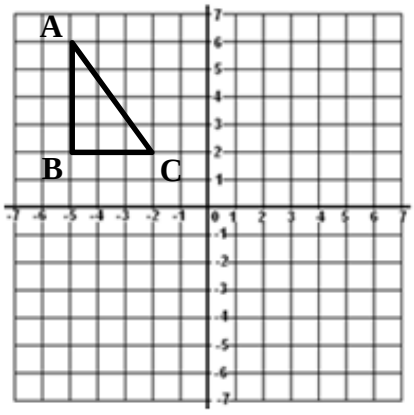
2) A. Reflect Triangle ABC in the *y*-axis.
B. Rotate the image 180° counterclockwise.



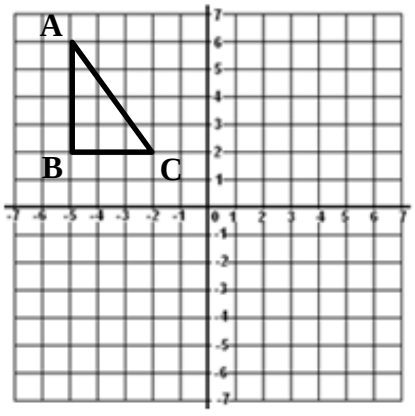
3) A. Dilate Triangle ABC ($k = \frac{1}{2}$)
B. Reflect the image through the origin.



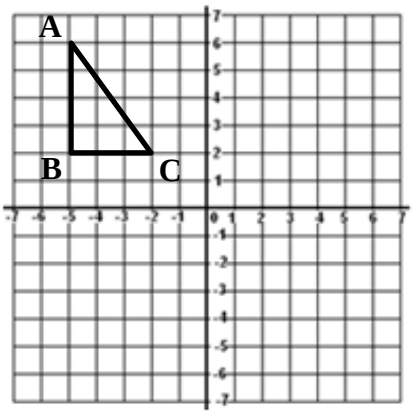
4) A. Reflect Triangle ABC in the line $y = 1$.
B. Reflect the image over the line $y = -x$.

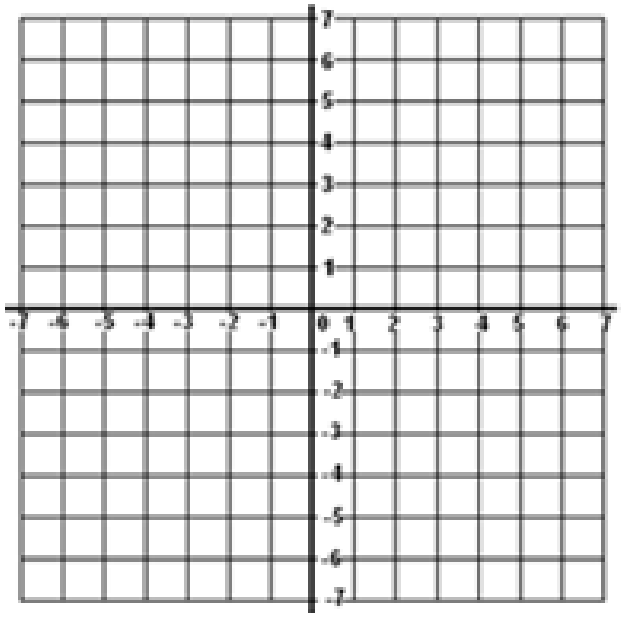


5) A. Rotate Triangle ABC 90° clockwise.
B. Reflect the image over the x-axis



6) A. Reflect Triangle ABC in the line $x = -1$.
B. Rotate the image 90° clockwise.



7) 

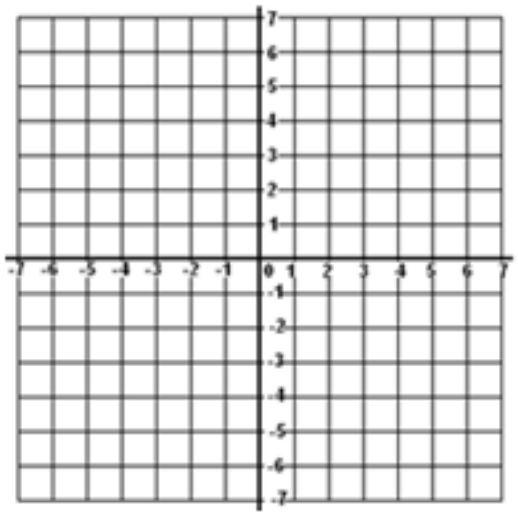
a) Plot rectangle ABCD,
A(-6,4), B(-3,6), C(-3,2), and D(-6,2)

b) Translate $(x, y) \rightarrow (x + 6, y - 2)$, and
label A'B'C'D'

c) Next Rotate A'B'C'D'180° counterclockwise
and label A''B''C''D''

What is the coordinate of A'' ? _____

---

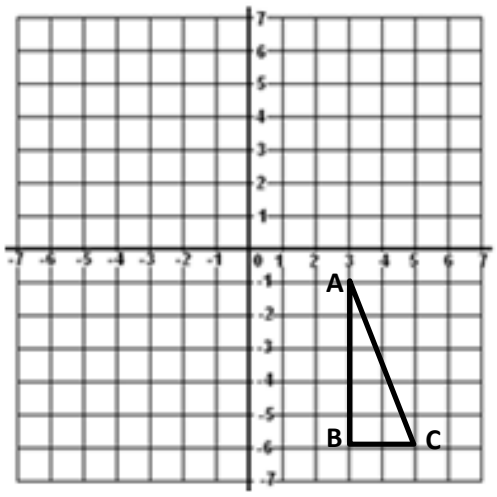
8) 

a) Plot P(-2,4), Q(-2,5), R(-4,6), S(-4,2)

b) Reflect in the *x*-axis and list the
new coordinates.

c) Reflect the image in the *y*-axis and list
the new coordinates.

---

9) 

a) Translate Triangle ABC 7 units up

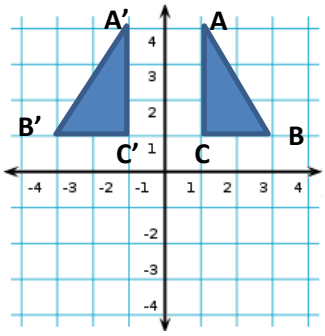
b) Then reflect the y axis

c) Then rotate 90 degrees counter clockwise

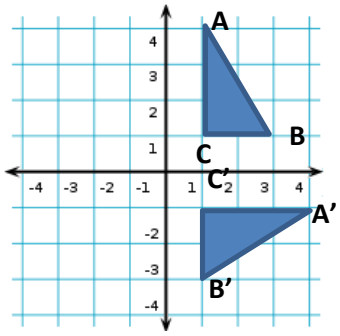
What is the coordinate of A''? _____

Name_____ **Math 8** **Unit 8 Review**

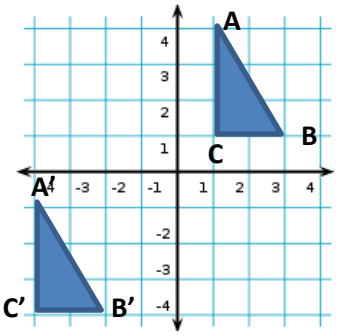
Use the graphs to find the type of transformation from the original triangle labeled ABC and answer the questions that follow.



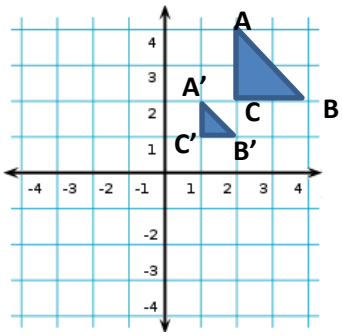
GRAPH I



GRAPH II



GRAPH III



GRAPH IV

1) a) Which graph is the result of a translation? _____
   b) What is the translation? _____

2) a) Which graph is the result of a reflection? _____
   b) What line is that the figure reflected over? _____

3) a) Which graph is the result of a rotation?
   b) How many degrees was it rotated and in what direction? _____

4) a) Which graph is the result of a dilation? _____
   b) How many times larger or smaller was it? ____

5) Name the transformation(s) (Translation, Reflection, Rotation, Dilation) where:

A. orientation is **not** preserved.

B. orientation is preserved.

C. size is preserved.

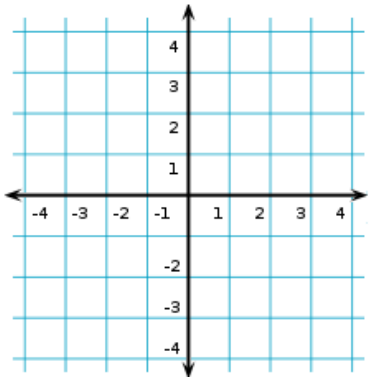
D. size is **not** preserved.

E. side length is **not** preserved.

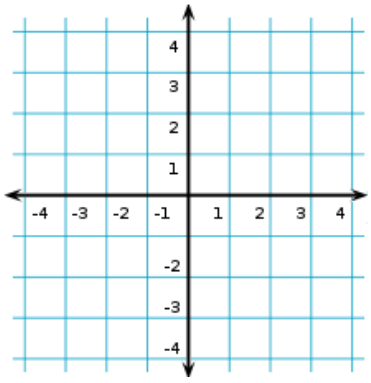
F. Images are congruent

6) Graph the transformation and label the new points.

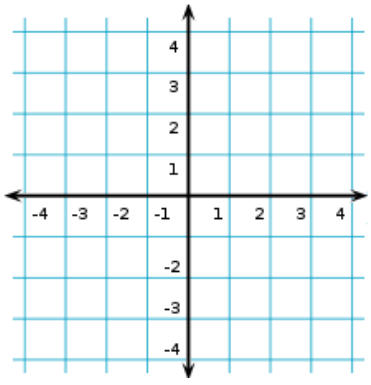
A. Reflect A (-1,3) in the *x*-axis



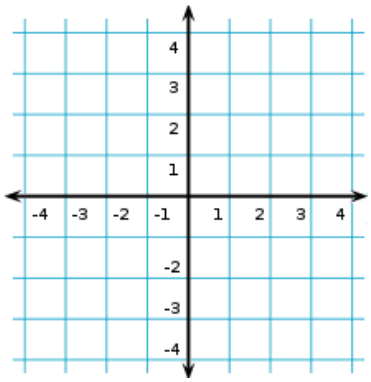
B. Reflect B (1,2) in the *y*-axis



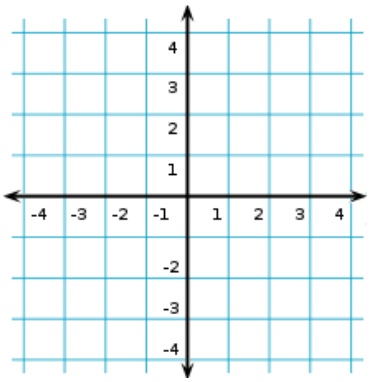
C. Reflect C (-2,-3) in the line $y = -1$



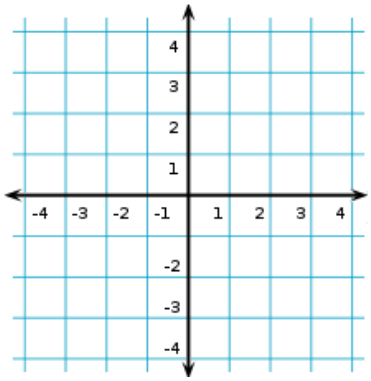
D. Reflect D(1,2) in the line $x = -1$



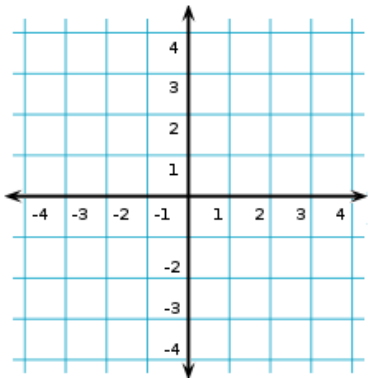
E. Reflect E(2, 0) in the line $y = x$



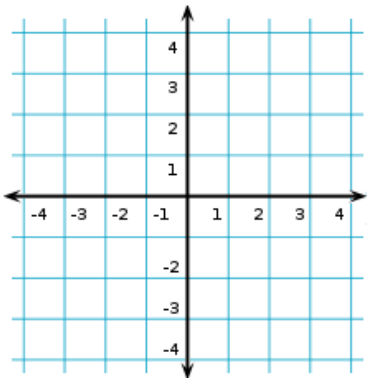
F. Reflect F(-3, -1) in the line $y = -x$



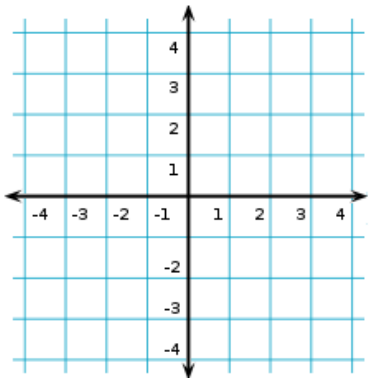
G. Reflect G(2,1) in the origin



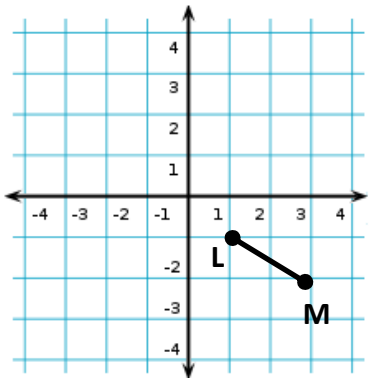
H. Translate H (-2,-1) → $(x + 2, y + 4)$



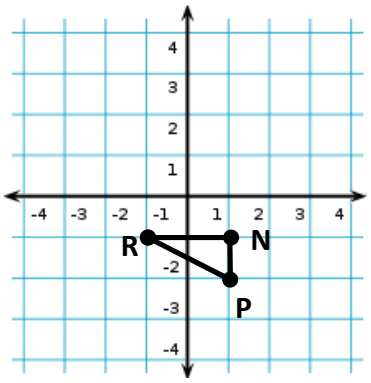
I. Translation I (-2,-1) 4 units down



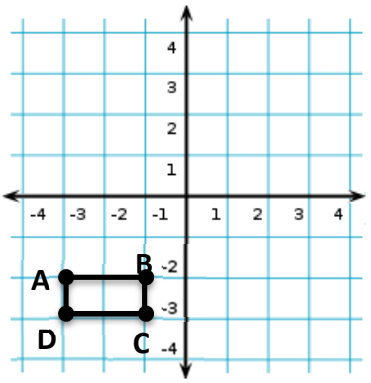
J. $T_{-2,3}$



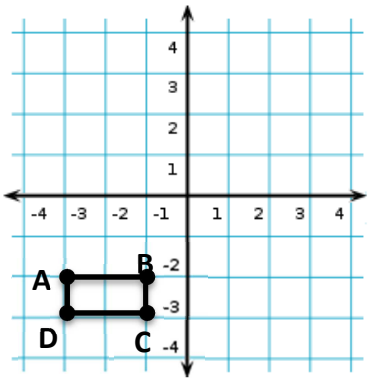
K. D_2



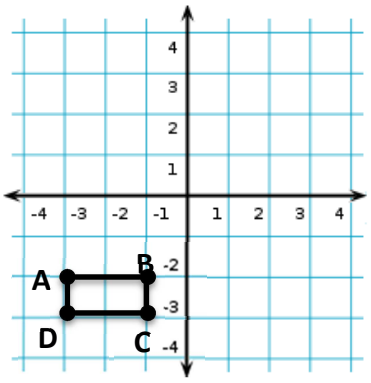
L. 90° clockwise rotation



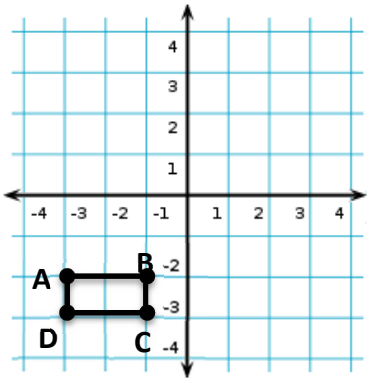
M. 180° counterclockwise rotation



N. 270° clockwise rotation



O. 180° clockwise rotation



7) a) When two triangles are similar the sides are _____

b) When two triangles are similar the angles are _____

c) When two triangles are similar they are the same _____ different _____.

---

8) Use the figure below to answer the following questions about the triangles:
Triangle ABC is similar to Triangle EDF:

Which angles are congruent to the angles given.

a) <A ≅ _____ b) <B≅ _____ c) <C ≅ _____

Fill in the missing parts of the proportion.

d) $\frac{AB}{BC} = \frac{}{DF}$ e) $\frac{AC}{EF} = \frac{BA}{}$ f) $\frac{BC}{AC} = \frac{DF}{}$ g) $\frac{DE}{BA} = -$

Unit 7 Review:

Solve each equations algebraically and check:

9) $4x + 2y = 12$
$2x + 4y = -18$

10) $2x + 3y = 24$
$y = 2x$

Unit 5 and 6 Review:

11) Circle which equations represent proportional relationships?

A) $y = 3x$ B) $y = ½ x – 3$ C) $y = 7x$ D) $y = -2x$ E) $y = \frac{2}{3}x$ F) $y = x$

What is the slope of a line that passes through the following points:

12) (5, -2) and (1, 6)

13) (3, -4) and (5, 12)

Write the equation of a line when:

14) b = 5, m = -2 15) slope = 1/3, y-intercept = 0 16) m = 9, b = -5 17) y-intercept = 2, slope = 8

18) Write the equation of the line:

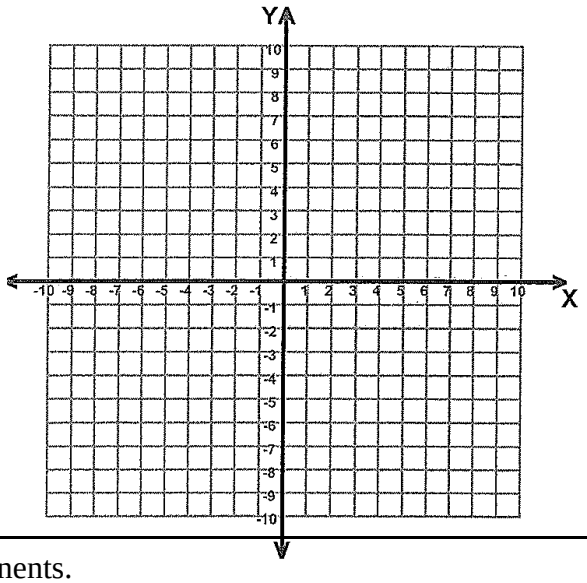
x	y
9	4
11	8
13	12
15	16
17	20

19) Write the equation of the line:

x	4	5	6	7	8
y	9	12	15	18	21

Unit 4 Review:

20) a) Graph the system of equations:
y = x
y = -x



b) What is the solution?_____

c) Check the solution:

Unit 3 Review: Simplify. Rewrite using all positive exponents.

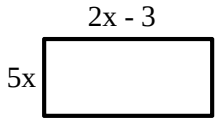
21) $8x^0$ 22) 8^0 23) $\frac{8}{0}$ 24) $\frac{0}{8}$ 25) 3^{-2} 26) $\frac{-1}{4}(3x-16)$

27) $(2xy^3)(-4xy^2)$ 28) $(x^8)(x^{-6})$ 29) $x^6 \div x^8$ 30) $40x^8y^3 \div 10x^5y^3$

Unit 1 and 2 Review:

31) Simplify $13 - 4 \times 5 - 2^3$ 32) Convert 50°F into Celsius using the formula $C = \frac{5}{9}(F - 32)$.

33)



a) Find the area. b) Find the perimeter.

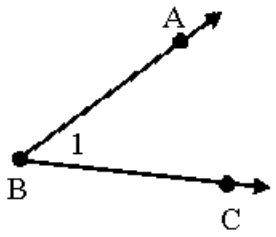
Unit 9

Angles

	Date	Lesson	Topic
		1	Complementary Angles
		2	Supplementary Angles
		3	Vertical Angles
		4	Adjacent Angles
			Quiz
		5	Parallel Lines Day 1
		6	Parallel Lines Day 2
		7	Triangles – Interior and Exterior Angles
		8	Parallel Lines and Triangles
			Review
			Test

Lesson 1
Complementary Angles

Do Now: Angles



1) What is the vertex of the angle? _____
2) What are the two rays that make up the angle? _____
3) What are the 4 names of the angle?

_____ , _____ , _____ , _____

Vocabulary:

Complementary Angles – _____

Perpendicular Lines - ⊥

Perpendicular Lines – 2 lines that intersect and form ____ right angles.

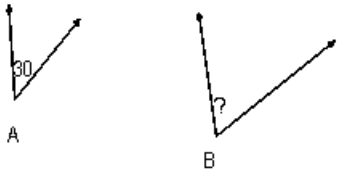
Equation for solving ALL complementary angle problems

$\angle 1 + \angle 2 =$ _____

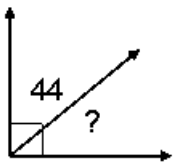
Rules for Solving Complementary Angle Problems
1 - Choose Equation
2 - Plug in the information
3 - Solve
4 - Answer the question

Examples:

1) Angles A and B are complementary find the measure of angle B.



2) Find the measure of the missing angle.



3) What is the complement of each of the following?

a) 40° _____ b) 28° _____ c) 6x° _____

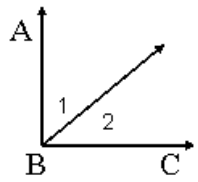
---

4) Given: $\overrightarrow{BA} \perp \overrightarrow{BC}$

$m < 1 = 43$

$m < 2 = x$

Find $m < 2$



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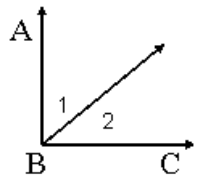
5) Given: $\overrightarrow{BA} \perp \overrightarrow{BC}$

$m < 1 = 2x + 40$

$m < 2 = 4x - 10$

Find $m < 2$



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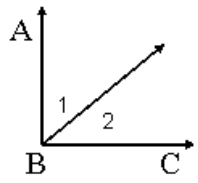
6) Given: $\overrightarrow{BA} \perp \overrightarrow{BC}$

$m < ABD = 4x + 20$

$m < DBC = x + 30$

Find $m < ABD$



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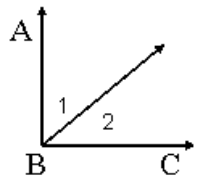
7) Given: $\overrightarrow{BA} \perp \overrightarrow{BC}$

$m < 1 : m < 2 = 5 : 4$

$m < 1 =$ _____

$m < 2 =$ _____

Find $m < 1$



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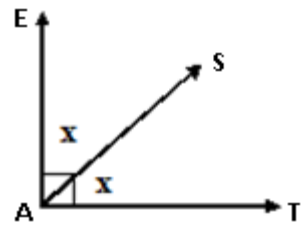
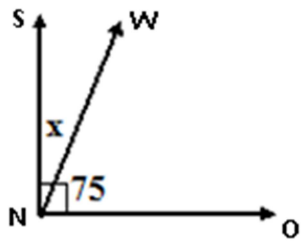
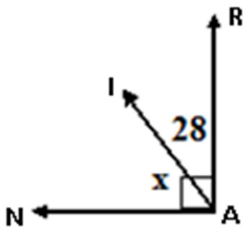
8) Find the measure of both angles.

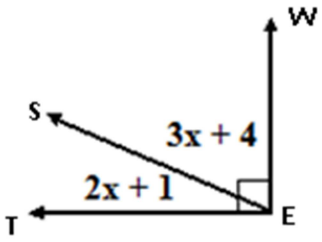


Try These:

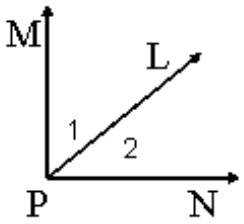
Solve for *x*

1) 

2) 

3) 

Given: $\overrightarrow{PM} \perp \overrightarrow{PN}$



4) $m < MPL = 23$
Find the $m < LPN$

5) $m < 1 = 2x + 40$
$m < 2 = x - 10$
Find the $m < 1$

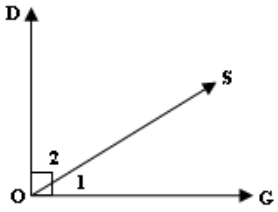
6) $m < 1 : m < 2 = 7 : 3$
Find $m < 2$

7) What is the complement of a 47 degree angle?

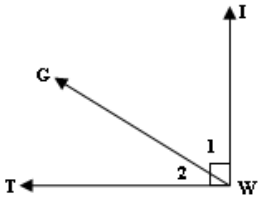
8) What is the complement of a 9x degree angle?

Lesson 1: Classwork/Homework

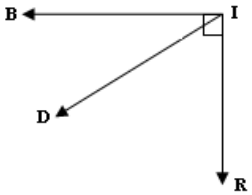
1) $m\angle 1 = 35^\circ$. Find $m\angle 2$.



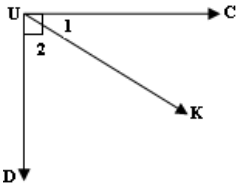
2) $m\angle 1 = 2x + 5$ and $m\angle 2 = 3x + 15$.
Find $m\angle 2$.



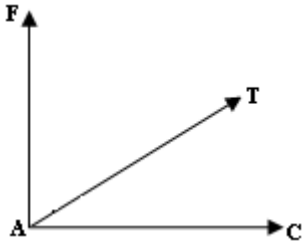
3) $m\angle BID = 2x + 40$ and $m\angle DIR = 4x - 10$
Find the measure of both angles.



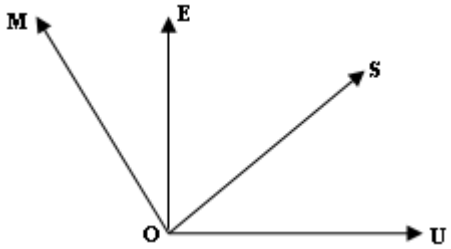
4) $m\angle 1 : m\angle 2 = 5:4$.
Find the measure of both angles.



5) $\overrightarrow{AF} \perp \overrightarrow{AC}$ If $m\angle FAT = m\angle CAT$,
find the measure of both angles.



6) Given $\overrightarrow{OE} \perp \overrightarrow{OU}$:
$m\angle EOS = 10^\circ$ and $m\angle MOU = 120^\circ$
Find $m\angle SOU$ and $m\angle MOE$.



*7) Let the measure of angle X = x and the measure of angle Y = y. Angle X and angle Y are complementary when $x + y = 90^\circ$. Use the equation to find the measure of angle Y when angle X has a measure of 40°.

*8) The measure of an angle is 10 more than three times the measure of its complement.
Find the measure of the larger angle.

Review Work:

9) Simplify: $(-4y^5)^3$

10) Solve: 4x – (-x – 3) = 2(3x – 4)

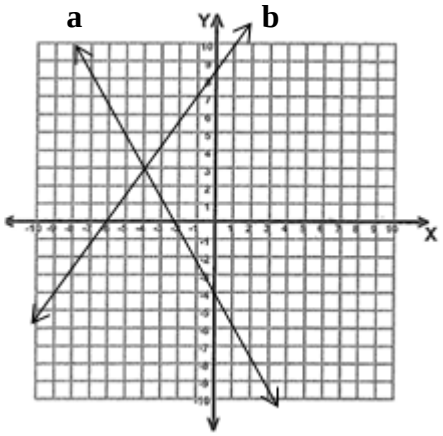
Use the graph to the right:

11) How many solutions are there to the system?

12) Name the solution

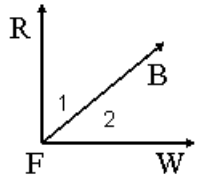
13) What is the equation of line a?

14) What is the equation of line b?



Extra Help:

Use the diagram below to answer questions 1 - 6



1) Given: $\overrightarrow{FR} \perp \overrightarrow{FW}$
$m < 1 = 17$
Find the $m < 2$

2) Given: $\overrightarrow{AF} \perp \overrightarrow{AC}$
$m <$ BFW = 49
Find the $m <$ RFB

3) Given: $\overrightarrow{AF} \perp \overrightarrow{AC}$
$m < 1 = 2x + 10$
$m < 2 = 4x + 20$
Find the x

---

4) Given: $\overrightarrow{AF} \perp \overrightarrow{AC}$
$m <$ RFB = x + 10
$m <$ BFW = 4x + 30
Find the $m <$ BFW

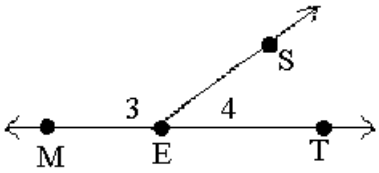
5) Given: $\overrightarrow{AF} \perp \overrightarrow{AC}$
$m < 1 : m < 2 = 7 : 3$
Find the $m < 1$

6) Given: $\overrightarrow{AF} \perp \overrightarrow{AC}$
$m < 1 : m < 2 = 7 : 3$
Find the $m < 1$

Lesson 2

Supplementary Angles

Do Now:



1) What is the name of angle 3? _____
2) What is the name of angle 4? _____
3) What is the name of the straight angle? _____
4) Which angle is acute? _____
5) Which angle is obtuse? _____

Vocabulary:

Straight Angle - an angle that measures 180° ←——————→

Supplementary Angles – _____

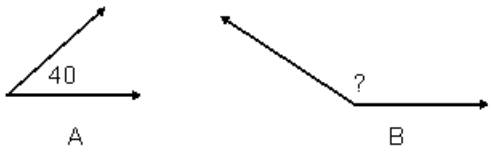
Equation for solving ALL supplementary angle problems

$\angle 1 + \angle 2 =$ _____

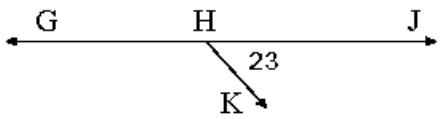
Rules for Solving Supplementary Angle Problems
1 - Choose Equation
2 - Plug in the information
3 - Solve
4 - Answer the question

Examples:

1) If ∠A and ∠B are supplementary, find the $m\angle B$



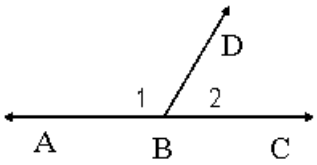
2) The following is a straight angle.



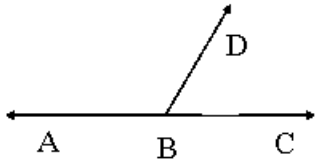
A) Name the missing angle.
B) Find the missing angle.

3) What is the supplement of each of the following?

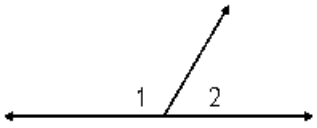
a) 73° _____ b) 98° _____ c) 3x° _____

4) 

Given:
$m < 1 = 2x + 40$
$m < 2 = 3x - 10$
Find x

5) 

Given:
$m < ABD = 8x - 20$
$m < DBC = 2x + 50$
Find $m < DBC$

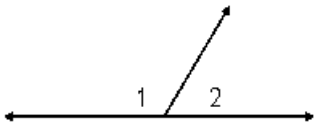
6) 

Given:
$m < 1 : m < 2 = 8 : 1$

$m < 1 =$ _____

$m < 2 =$ _____

Find $m < 1$

7) 

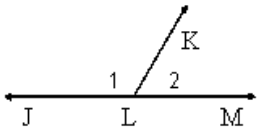
Given:
$m < 2$ is 2/3 the $m < 1$

$m < 1 =$ _____

$m < 2 =$ _____

Find $m < 1$

Try These: Use diagram below for question 1 - 3



1) $m < 1 = 99$
Find the $m < 2$

2) $m < JLK = 3x + 30$
$m < KLM = x + 10$
Find the $m < KLM$

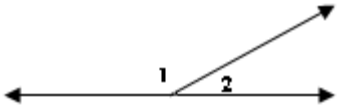
3) $m < 1 : m < 2 = 2 : 7$
Find $m < 1$

4) What is the supplement of a 38 degree angle? _____

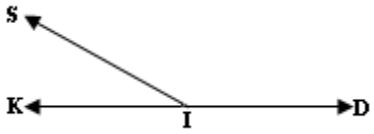
5) What is the supplement of a 5x degree angle? _____

Lesson 2: Classwork/Homework

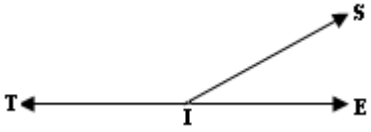
1) $m\angle 1 = 135^\circ$. Find $m\angle 2$.



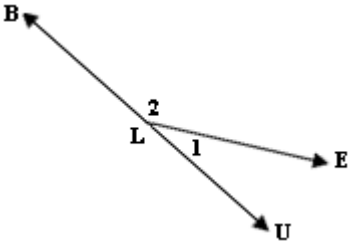
2) $m\angle KIS = 2x + 10$ and $m\angle SID = 4x + 20$. Find $m\angle DIS$.



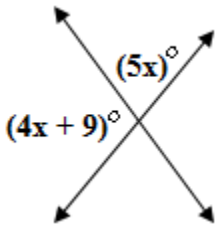
3) $m\angle TIS = 3x + 65$ and $m\angle EIS = 2x - 35$ Find the measure of both angles.



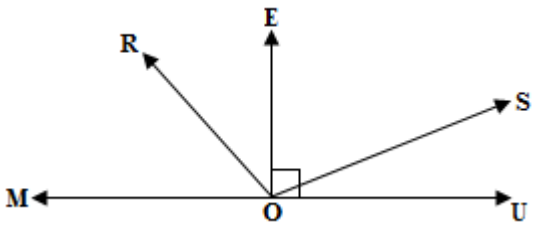
4) $m\angle 1 : m\angle 2 = 7:3$. Find the measure of both angles.



5) Use the picture below to determine the *measure* of each angle.



6) Given line $\overleftrightarrow{MOU}$
$m\angle EOS = 60^\circ$
$m\angle MOE = 90^\circ$
$m\angle ROU = 130^\circ$
Find:
$m\angle SOU =$ _____
$m\angle ROE =$ _____
$m\angle ROM =$ _____



7) What is the supplement of a 29 degree angle? _____

8) What is the supplement of a x degree angle? _____

---

9) Create a data table showing 5 angles, their complements, their supplements, and the difference of their complements and supplements.

Angle	Complement	Supplement	Difference

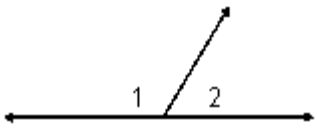
What pattern did you notice? _____

_____

Explain why this is true? _____

_____

Extra Help: Use the diagram below to answer questions 1 - 6



1) $m < 2 = 45$
Find the $m < 1$

2) $m < 1 = 143$
Find the $m < 2$

3) $m < 1 = 2x + 10$
$m < 2 = 4x + 20$
Find the x

---

4) $m < 1 = x + 30$
$m < 2 = 4x + 40$

5) $m < 1 : m < 2 = 1:5$
Find the $m < 2$

6) $m < 1 : m < 2 = 7:3$
Find the $m < 1$

Lesson 3
Vertical Angles

Vocabulary:

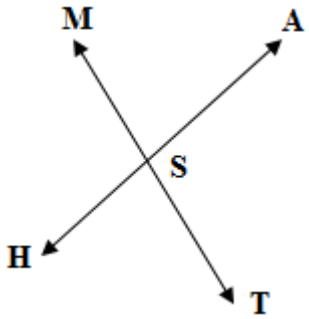
Vertical Angles - A pair of non-adjacent angles that are **equal** to each other.

Equation for solving ALL vertical angle problems

$\angle 1 = \angle 2$

Rules for Solving Vertical Angle Problems
1 - Choose Equation
2 - Plug in the information
3 - Solve
4 - Answer the question

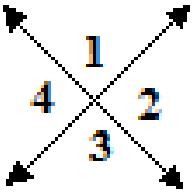
Examples:



Name the vertical angle to the angle given:

1) $\angle MSA \cong \angle$ _____
2) $\angle MSH \cong \angle$ _____
3) $\angle HST \cong \angle$ _____
4) $\angle TSA \cong \angle$ _____

5) Name an angle congruent to angle 1. _____

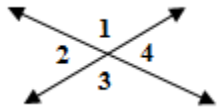


6) Name an angle supplementary to angle 1. _____

7) If angle 1 = 70°, then: $\angle 2$ =_____, $\angle 3$ =_____, $\angle 4$=_____

8) If angle 2 = 135°, then: $\angle 1$=_____, $\angle 3$ =_____, $\angle 4$ =_____

9) Given:
$m\angle 1 = 115°$
$m\angle 3 = x$
Find the $m\angle 2$



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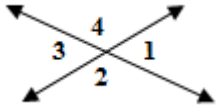
10) Given:
$m\angle 4 = 5x$
$m\angle 2 = 3x + 20$
Find x



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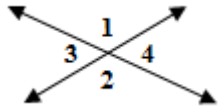
11) Given:
$m\angle 1 = 3x - 10$
$m\angle 2 = 2x + 50$
Find the $m\angle 2$



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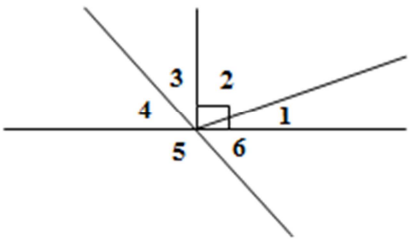
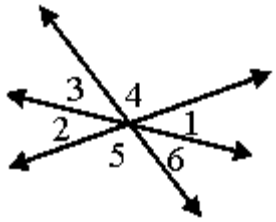
12) Find the measure of all the angles if m < 1 = 30° and the m < 4 = 45°



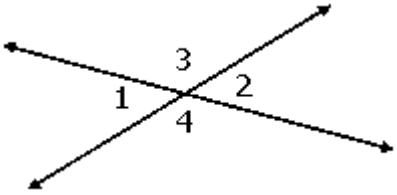
Try These:



1) Are < 2 and < 6 vertical angles? Why?

2) Name a pair of vertical angles.

Use the diagram below to answer questions 3 – 6



3) If the $m < 1 = 50$

Find the $m < 2$ _____ $m < 3$ _____ $m < 4$ _____

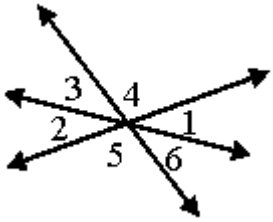
Given:
$m < 3 = 7x + 18$
$m < 4 = 5x + 48$

4) Find x

5) Find $m < 3$

6) Find $m < 2$

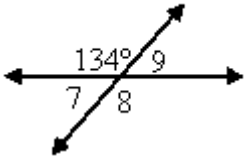
Lesson 3: Classwork



Is the indicated pair of angles vertical? (yes or no)

1) < 1 and < 2 _____ 2) < 5 and < 6 _____ 3) < 3 and < 4 _____

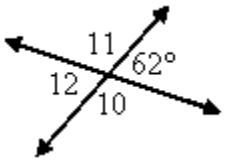
4) < 3 and < 5 _____ 5) < 4 and < 5 _____ 6) < 3 and < 6 _____



7) Find the $m < 7$ _____

8) Find the $m < 8$ _____

9) Find the $m < 9$ _____



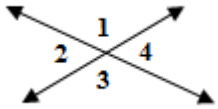
10) Find the $m < 10$ _____

11) Find the $m < 11$ _____

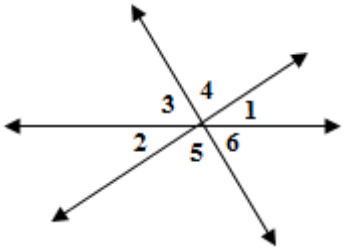
12) Find the $m < 12$ _____

Lesson 3: Homework

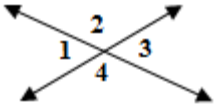
1) $m\angle 1 = 35^\circ$. Find $m\angle 2$, $m\angle 3$ and $m\angle 4$.



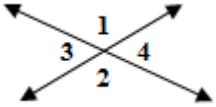
2) If $m\angle 2 = 42^\circ$ and $m\angle 4 = 92^\circ$, find $m\angle 6$.



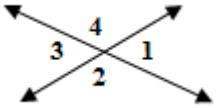
3) If $m\angle 2 = 7x + 18$ and $m\angle 4 = 5x + 48$, find $m\angle 2$.



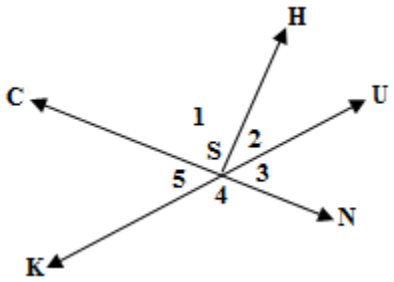
4) If $m\angle 3 = 5x - 10$ and $m\angle 4 = 45^\circ$. Find the measure of both angles.



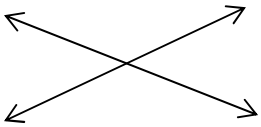
5) If $m\angle 1 = x + 15$ and $m\angle 3 = 2x$, find $m\angle 2$.



6) Given lines CN and UK, $\overleftrightarrow{SH} \perp \overleftrightarrow{SN}$ and $m\angle USN = 50^\circ$. Find $m\angle 1$, $m\angle 2$, $m\angle 4$, and $m\angle 5$.



7) $\overleftrightarrow{CD}$ and $\overleftrightarrow{EF}$ intersect at point G. If $m\angle EGD = 3x - 20$ and $m\angle CGF = x + 10$, find $m\angle EGD$.



8) Given that the measure of an angle is 50º, find:

A) the measure of its complement _____

B) the measure of its supplement _____

C) the measure of an angle congruent to it _____

D) the measure of a second angle that when they are adjacent to each other, their sum is 140º _____

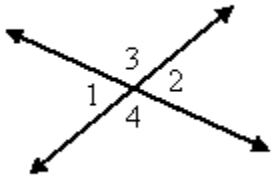
---

9) Evaluate $3x^2 - x + 9$ when $x = -4$.

---

10) State the possible values for x and y if $\frac{x}{y}$ has a value of 0.

Extra Help:



---

1) $m < 1 = 3x - 20$, $m < 2 = x + 10$. find x

---

2) $m < 3 = 3x - 20$, $m < 4 = x + 40$. find the $m < 4$

---

3) $m < 2 = 6x - 10$, $m < 1 = x + 30$. find the $m < 2$

---

4) $m < 1 = 7x - 4$, $m < 2 = 3x + 12$. find the $m < 3$

---

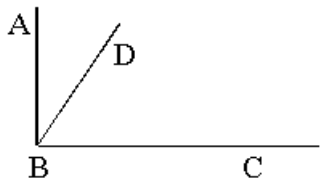
5) $m < 1 = 8x + 12$, $m < 2 = 3x + 32$. find the $m < 4$

Review Complementary, Supplementary, & Vertical Angles

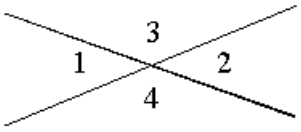
1) What is the supplement of a 42º angle? _____

2) What is the complement of a 83º angle? _____

3) An angle measures 57º, what does a angle vertical to it measure? _____

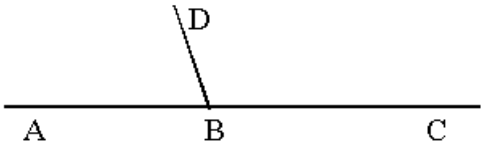


4) If $m < ABD = 35º$, what is the $m < CBD$?



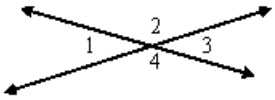
5) If angle 3 measures 122º, what does angle 4 measure?

6) If angle 3 measures 122º, what does angle 1 measure?



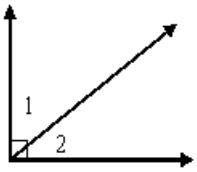
7) If angle DBC measures 108º, what does angle DBA measure?

8)



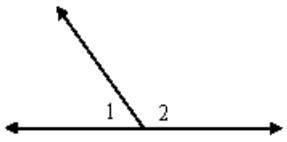
< 1 = 4x – 25
< 3 = 2x + 13
Find the measure of <1

9)



< 1 = 2x – 7
< 2 = 3x – 8.
Find the measure of < 2

10)

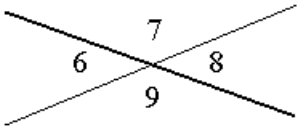


< 1 = 2x – 7
< 2 = 3x – 8
Find the *m* < 1.

< A = 42º	< B = 116º	< C = 64º	< D = 48º

11) Which two angles are complementary? _____

12) Which two angles are supplementary? _____



13) Name a pair of congruent angles. _____

14) Name a pair of supplementary angles. _____

---

15) If 2 angles are complementary and one angle is 89º, find its complement. _____

16) If 2 angles are complementary and one angle is 5xº, find its complement. _____

17) If 2 angles are supplementary and one angle is 89º, find its supplement. _____

18) If 2 angles are supplementary and one angle is 5xº, find its supplement._____

---

19) Two complementary angles are in a ratio of 4:11. Find each angle.

---

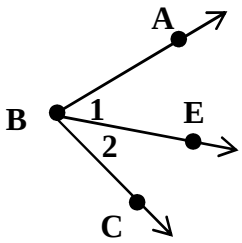
20) Two supplementary angles are in a 2:7 ratio. Find the larger angle.

---

21) Two vertical angles measure 8x + 6 and 4x + 22. Solve for x

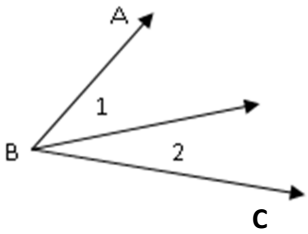
Lesson 4
Adjacent Angles

Adjacent Angles – Two angles that share a common vertex and one common side. They do not overlap.



1) What is the name of angle 1? _____
2) What is the name of angle 2? _____
3) Name a pair of adjacent angles. _____
4) Name the large angle made up by the 2 adjacent angles. _____

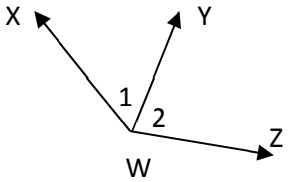
Rules for Solving Adjacent Angle Problems
1 - Choose Equation
2 - Plug in the information
3 - Solve
4 - Answer the question



Equation Used to Solve Adjacent Angle Problems

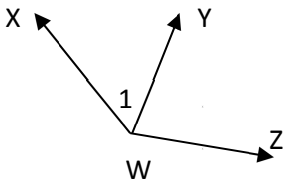
$< 1 + < 2 =$ _____

Examples:



1) Given:
$m < 1 = 47°$
$m < 2 = 59°$
What is the $m <$ XWZ

2)



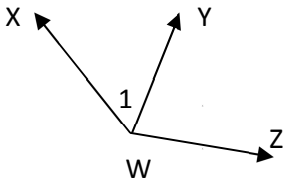
Given:

$m < XWY = 35°$

$m < XWZ = 89°$

find the $m < YWZ$

3)



Given:

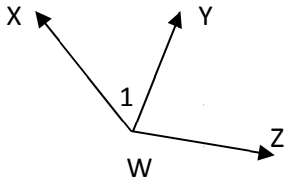
$m < XWZ = 130°$

$m < 1 = 2x + 8$

$m < 2 = 4x + 2$

find $m < 2$

4)



Given:

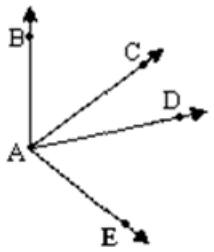
$m < XWZ = 140°$

$m < 1$**:** $m < 2 = 3$**:**4

find $m < 1$

Try These:

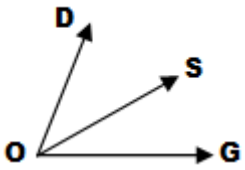
1) In the diagram, which two angles are adjacent?



1. $\angle CAD$ and $\angle CAE$
2. $\angle BAC$ and $\angle DAE$
3. $\angle BAC$ and $\angle CAD$
4. $\angle DAE$ and $\angle BAE$

---

2)



Given:
$m < DOS = 40°$
$m < SOG = 35°$
Find $m < DOG$.

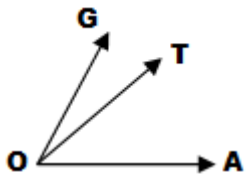
---

3)

Given:
$m < FRG = 70°$
$m < FRO = 110°$
Find $m < GRO$

---

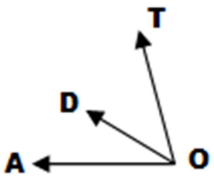
4)



Given:
$m < GOT$: $m < TOA = 2:3$
$m < GOA = 65°$
Find both angles

---

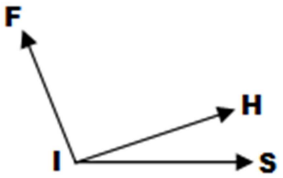
5)



Given:
$m < TOD = 6x$
$m < DOA = 2x$
$m < TOA = 88°$
Find both angles

---

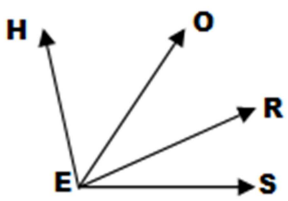
6)



Given:
$m < FIS = 125°$
$m < FIH = 3x + 45$
$m < HIS = 2x + 25$
Find both angles

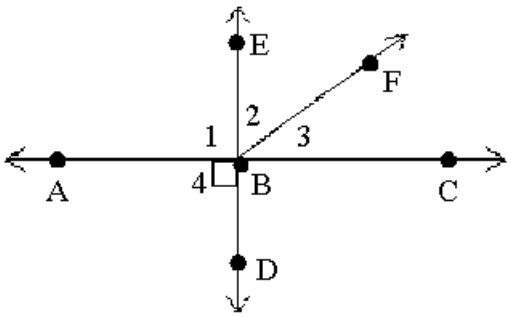
---

*7)



Given:
$m < \angle HEO = 40°$, $m < OER = 20°$, $m < HES = 110°$
Find $m < RES$

Lesson 4: Classwork/Homework



1) What is the name of angle 1? _____

2) What is the name of angle 2? _____

3) What is the name of angle 3? _____

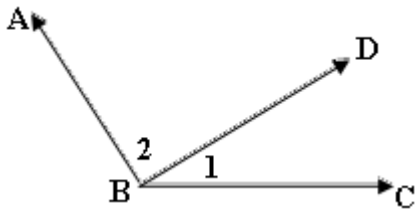
4) What is the name of angle 4? _____

5) What is the name of a right angle? _____

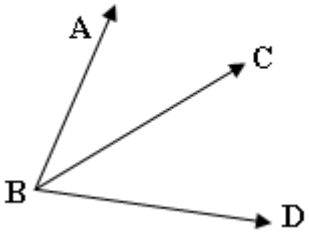
6) What is the name of a straight angle? _____

---

7) $m < 1 = 35^\circ$ and $m < 2 = 72^\circ$
Find $m\angle ABC$.



8) $m < ABC = 32^\circ$ and $m < ABD = 85^\circ$.
Find $m < DBC$.



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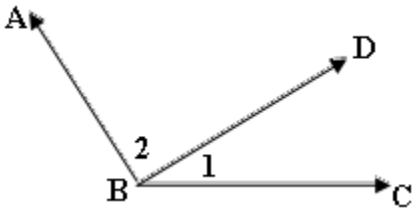
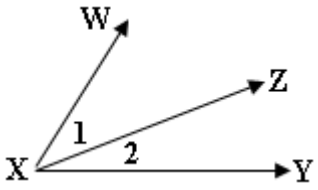
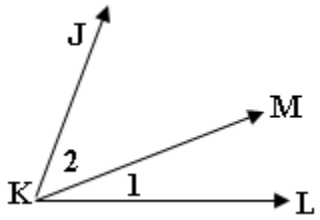
9) $m < 1 = 2x + 10$, $m < 2 = x + 45$ and $M < ABC = 115^\circ$. Find the measures of angles 1 and 2.



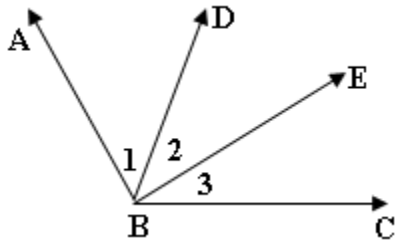
10) $m < 1 = x + 25$, $m < 2 = 3x + 35$ and $m < WXY = 80^\circ$. Find $m < 1$.



11) $m < 1 : m < 2 = 4:5$. If $m < JKL = 63^o$, find $m\angle 1$.



*12) $m < 1 = 3x + 10$, $m < 2 = 2x + 20$ and $m < 3 = x + 10$, and $m < ABC = 130^o$. Find x, $m < 1$, $m < 2$, $m < 3$, and $m < ABE$.



13) < ARB and < BRT are adjacent angles. If $m < ARB = 120^o$, and $m < ARB$ is 5 times $m < BRT$, draw the figure and find $m\angle BRT$.

14) The formula for the height of a rocket fired straight up from the ground with an initial velocity of 80 ft/sec is $H = -16t^2 + 80t$ where t is the time in seconds. Find the height after 4 seconds.

15) Write 10^{-3} as a positive exponent.

16) How many solutions does the equation $4x + 2 + 2x - 8 = 3(2x - 2)$ have?

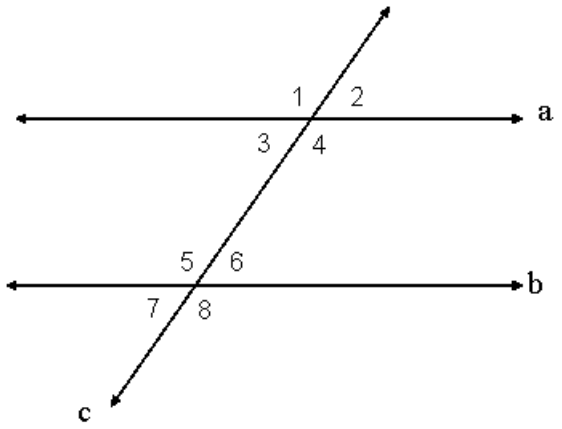
Lesson 5
Parallel Lines Day 1

Vocabulary:

Parallel Lines - 2 lines in the same plane that never intersect

Transversal - the line that cuts through the parallel lines.

When 2 parallel lines are cut by a transversal 8 angles are formed.



Types of angles

1) **Corresponding Angles** – The 2 angles located in matching corners. They are equal in measure

< ____ and < ____ < ____ and < ____ < ____ and < ____ < ____ and < ____

2) **Alternate Interior Angles** - The 2 angles located inside the parallel lines in opposite corners. They are equal in measure.

< ____ and < ____ < ____ and < ____

3) **Alternate Exterior Angles** - The 2 angles located outside the parallel lines in opposite corners. They are equal in measure.

< ____ and < ____ < ____ and < ____

4) **Vertical Angles** - The 2 angles opposite each other when 2 lines intersect. They are equal in measure.

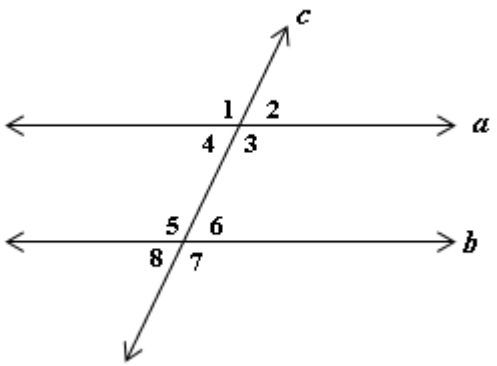
< ____ and < ____ < ____ and < ____ < ____ and < ____ < ____ and < ____

5) **Supplementary Angles** - The 2 angles that make a straight line. They equal to 180°.

< ____ and < ____ < ____ and < ____ < ____ and < ____ < ____ and < ____

< ____ and < ____ < ____ and < ____ < ____ and < ____ < ____ and < ____

Examples:



When 2 parallel lines are cut by a transversal 8 angles are formed.

- 4 angles are acute angles
- 4 angles are obtuse

Equation3 for solving ALL Parallel line angle problems

1) Give the measure of each angle if $m < 1 = 100°$

2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7 _____ 8 _____

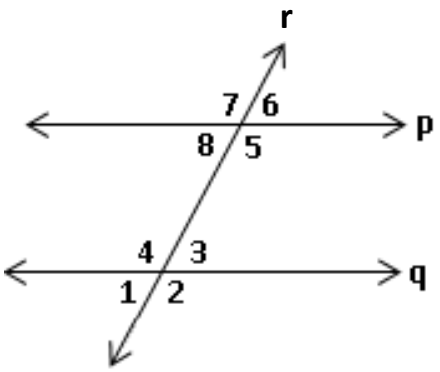
2) If $m < 1 = 95°$, find the $m < 5$ _____

3) If $m < 1 = 117°$, find the $m < 7$ _____

4) If $m < 3 = 120°$, find the $m < 4$ _____

5) If $m < 5 = 122°$, find the $m < 2$ _____

Try These:



1) Which lines are the parallel lines? _____
2) Which line is the transversal? _____

Name a pair of

3) Corresponding Angles _____
4) Alternate Interior Angles _____
5) Alternate Exterior Angles _____
6) Vertical Angles _____
7) Supplementary Angles _____

8) Give the measure of each angle if $m < 3 = 65°$

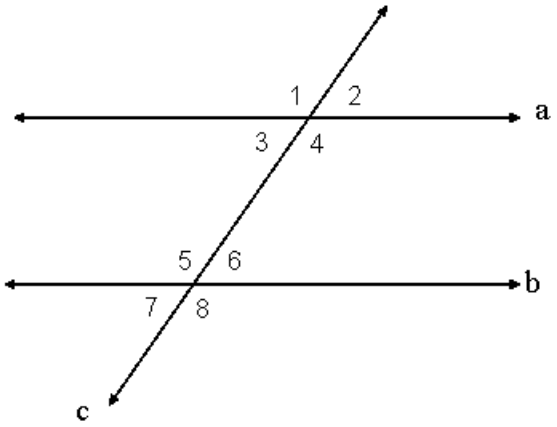
1 _____ 2 _____ 4 _____ 5 _____ 6 _____ 7 _____ 8 _____

9) Give the measure of each angle if $m < 8 = 42°$

1 _____ 2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7 _____

10) Give the measure of each angle if $m < 4 = 108°$

1 _____ 2 _____ 3 _____ 5 _____ 6 _____ 7 _____ 8 _____



11) If $m < 4 = 95°$, find the $m < 6$ _____

12) If $m < 3 = 120°$, find the $m < 6$ _____

13) If $m < 8 = 132°$, find the $m < 1$ _____

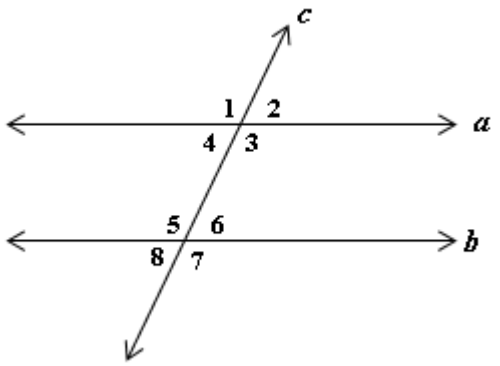
14) If $m < 1 = 112°$, find the $m < 5$ _____

15) If $m < 5 = 117°$, find the $m < 8$ _____

16) If $m < 5 = 122°$, find the $m < 7$ _____

17) If $m < 2 = 73°$, find the $m < 3$ _____

18) If $m < 6 = 82°$, find the $m < 7$ _____



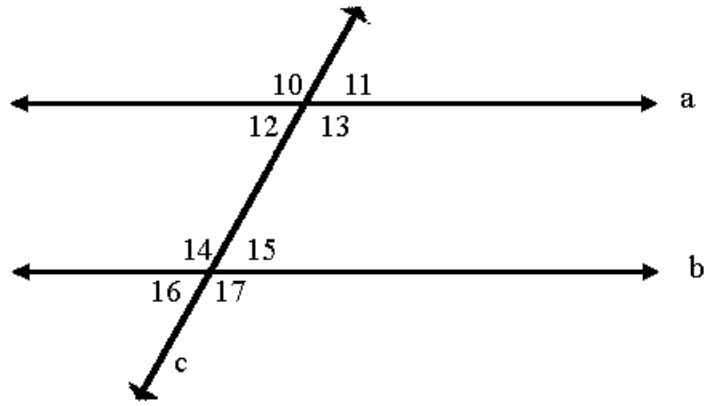
19) True or False: $\angle 1 \cong \angle 5$?_____

20) True or False: $\angle 1 \cong \angle 6$?_____

21) True or False: $\angle 4 \cong \angle 5$?_____

22) True or False: $\angle 4 \cong \angle 6$?_____

Lesson 5: Classwork/Homework



Tell what type of angle each pair is (supplementary angles, vertical angles, corresponding angles, alternate interior angles, alternate exterior angles)

1) <10 and <14 _____

2) <11 and <16 _____

3) <14 and <15 _____

4) <14 and <17 _____

5) <12 and <15 _____

6) <10 and <13 _____

7) Give the measure of each angle in $m < 11 = 75°$

10 _____ 12 _____ 13 _____ 14 _____ 15 _____ 16 _____ 17 _____

8) Give the measure of each angle in $m < 14 = 108°$

10 _____ 11 _____ 12 _____ 13 _____ 15 _____ 16 _____ 17 _____

9) Give the measure of each angle in $m < 17 = 100°$

10 _____ 11 _____ 12 _____ 13 _____ 14 _____ 15 _____ 16 _____

10) True or False: Angles 12 and 14 are congruent.

11) True or False: Angles 12 and 15 are congruent.

12) Name the parallel lines. _____

13) Name the transversal. _____

14) If $m < 14 = 95°$, find the $m < 17$ _____

15) If $m < 10 = 120°$, find the $m < 17$ _____

16) If $m < 10 = 132°$, find the $m < 11$ _____

17) If $m < 17 = 117°$, find the $m < 13$ _____

18) If $m < 15 = 22°$, find the $m < 12$ _____

19) If $m < 14 = 73°$, find the $m < 17$ _____

Lesson 6
Parallel Lines Day 2

Rules for Solving Parallel Line Angle Problems

1 - Choose Equation

2 - Plug in the information

3 - Solve

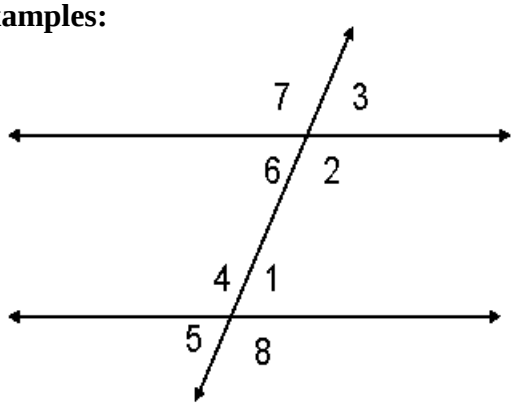
4 - Answer the question

○ = ○

□ = □

○ + □ = **180°**

Examples:

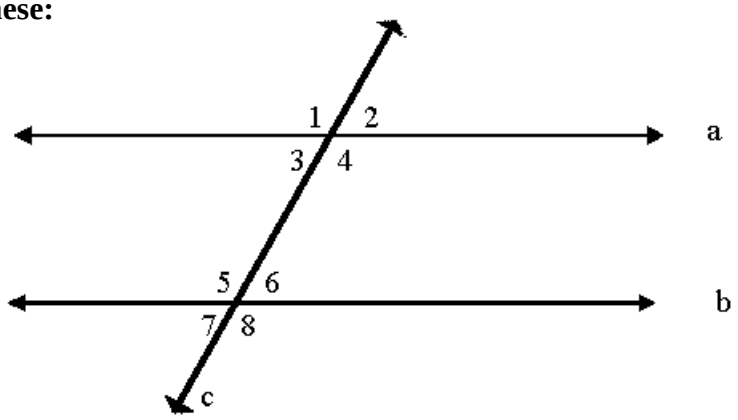


1) Given:
$m < 4 = 3x - 10$
$m < 2 = x + 80$
Solve for x

2) Given:
$m < 7 = 3x + 20$
$m < 3 = x + 40$
Find the $m < 3$

3) Given:
$m < 1 = 5x - 10$
$m < 5 = 2x + 20$
Find the $m < 3$

Try These:



1) Give the measure of each angle in $m < 1 = 105°$

2 _____ 3 _____ 4 _____ 5 _____ 6 _____ 7 _____ 8 _____

2) If $m < 4 = 100°$, find the $m < 1$

3) If $m < 3 = 120°$, find the $m < 6$

4) If $m < 1 = 109°$, find the $m < 5$

5) If $m < 2 = 42°$, find the $m < 7$

Solve algebraically:

6) If $m < 4 = 5x + 10$ and the $m < 8 = x + 30$, solve for x

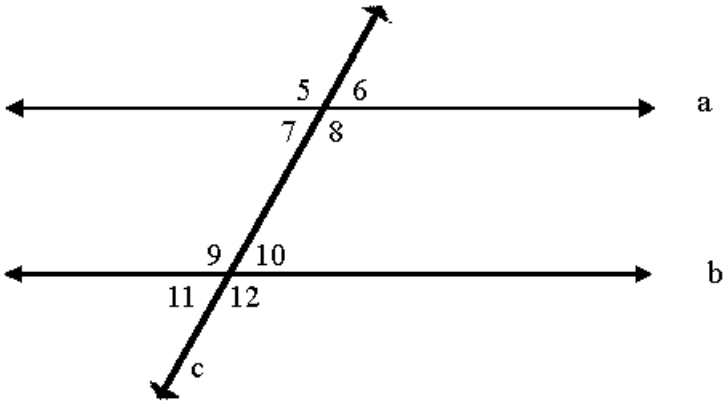
7) If $m < 3 : m < 4 = 4:5$ Solve for x

8) If $m < 1 = 3x + 20$ and the $m < 2 = x + 40$, find $m < 2$

9) If $m < 4 : m < 2 = 7:3$ Find the $m < 2$

10) If $m < 6 = 5x - 10$ and the $m < 7 = 2x + 20$, find the $m < 5$

Lesson 6: Classwork/Homework



1) Give the measure of each angle in $m < 7 = 58°$

5 _____ 6 _____ 8 _____ 9 _____ 10 _____ 11 _____ 12 _____

2) If $m < 5 = 98°$, find the $m < 12$

3) If $m < 7 = 72°$, find the $m < 10$

4) If $m < 9 = 105°$, find the $m < 12$

5) If $m < 5 = 42°$, find the $m < 6$

6) If $m < 5 = 3x - 10$ and the $m < 8 = x + 80$, solve for x

7) If $m < 7 = 5x + 12$ and the $m < 11 = 2x + 51$, find the measure of $m < 7$

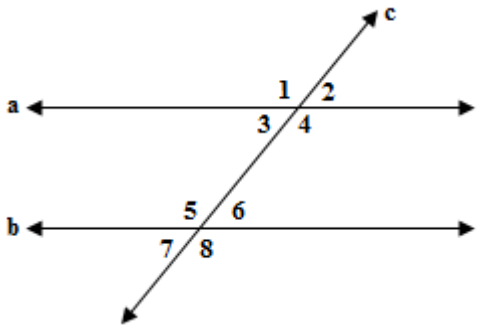
8) If $m < 9 = 3x - 10$ and the $m < 10 = 2x + 40$, find the measure of $m < 9$

9) True or False: Angles 7 and 10 are congruent.

10) True or False: Angles 11 and 12 are congruent.

Extra Help:

Use the diagram to the right to answer the following questions 1 – 6 if $a \parallel b$.



1) If $m\angle 3 = 3x - 10$ and $m\angle 6 = x + 80$, find x.

2) If $m\angle 2 = 5x$ and $m\angle 6 = x + 20$, find $m\angle 2$.

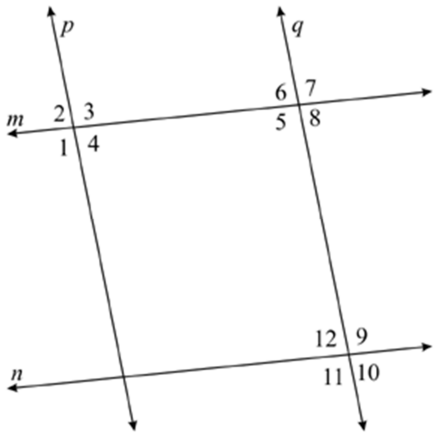
3) If $m\angle 3 = 3x - 10$ and $m\angle 5 = 2x + 40$, find $m\angle 5$.

4) If $m\angle 2 = 5x - 12$ and $m\angle 7 = 3x + 30$, find the measure of both angles.

5) If $m\angle 5 = 5x + 12$ and $m\angle 8 = 2x + 51$, find $m\angle 2$.

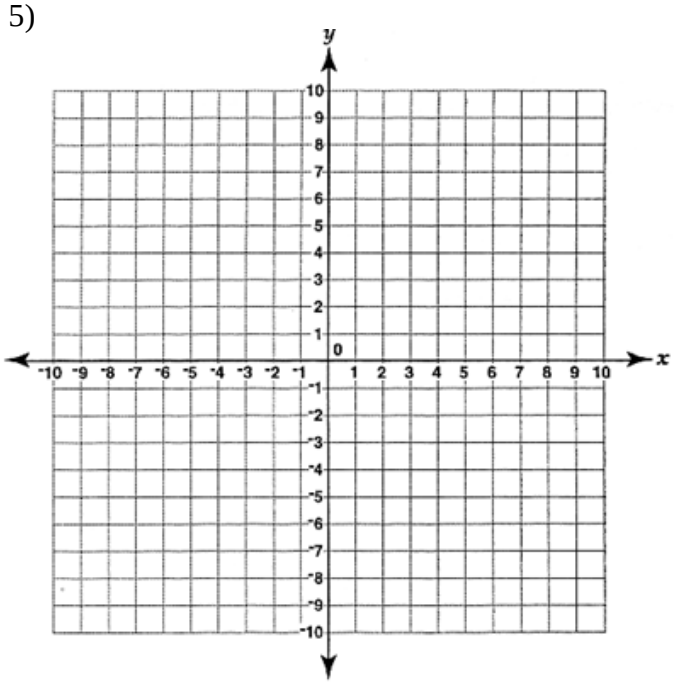
6) If $m\angle 6 = 4x + 20$ and $m\angle 1 = 3x + 90$, find the measure of all eight angles.

7) If the $m\angle 1 = 110$, line *p* is parallel to line *q*, and line *m* is parallel to line *n*, find the measures of all 12 angles.



m **1= _____**	***m*** **7= _____**
m **2= _____**	***m*** **8= _____**
m **3= _____**	***m*** **9= _____**
m **4= _____**	***m*** **10= _____**
m **5= _____**	***m*** **11= _____**
m **6= _____**	***m*** **12= _____**

8) Which quadrant is each ordered pair in? A) (-3, 2) B) (2, 5)



9) Find the slope of the line that passes through the two points from #8.

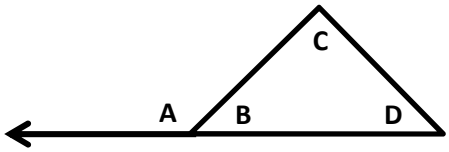
10) Write the equation of the line that passes through the two points from #8.

11) Write the equation of a line *parallel* to the line from #10.

12) Write the equation of a line that *overlaps* the line from #10.

Lesson 7
Triangles – Interior and Exterior Angles

Vocabulary:
Parts of a triangle-



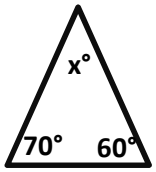
Base:_____ **Leg:_____**

Interior Angles:_____ **Exterior Angles:_____**

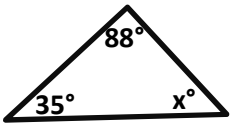
The sum of the angles of a triangle is _____ degrees.

Examples:
Find the missing angles in the following triangles (NOT DRAWN TO SCALE):

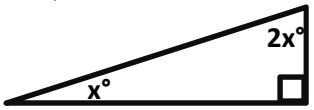
1)



2)

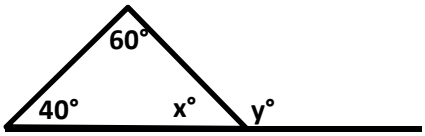


3)

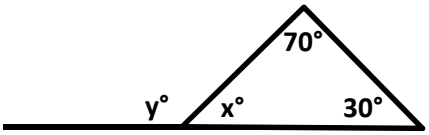


Solve for x and y on each set of triangles:

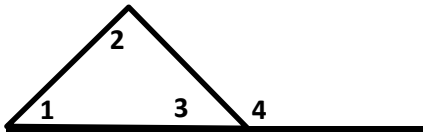
4)



5)



6) What is the relationship between y and the two remote interior angles?



Interior Angles: <_____, <_____ and <_____

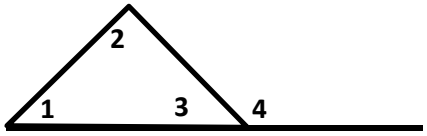
Exterior Angle: <_____

<1 + <2 = <_____

The exterior angle of a triangle is congruent to the sum of the remote interior angles.

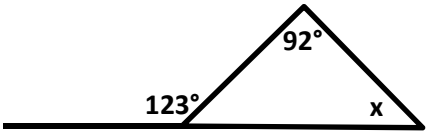
---

7) Given the triangle below:



If $m\angle 1 = 34^o$ and $m\angle 2 = 88^o$,
Find $m\angle 3$ and $m\angle 4$.

8) Find the value of *x*:



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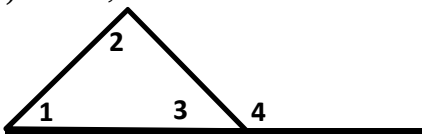
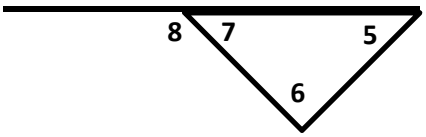
9) Find x, m<1 and m <2:



Given: $m\angle 1 = x + 10$
$m\angle 2 = 2x + 20$,
$m\angle 4 = 120$
Find the m<5 = _____ m <6 = _____

10)

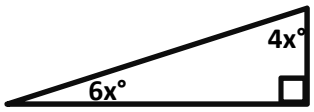


Given: m<5 = 2x + 8
m<6 = 3x + 12
m<8 = 130

m <7 = _____ m <8 = _____

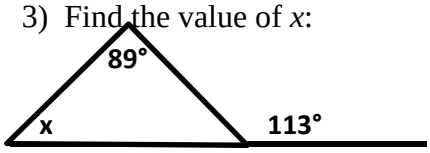
Try These:

1) Solve for x:

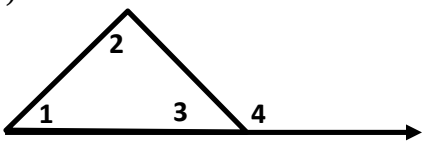


2) The three angles of a triangle are in the ratio of 3:6:9. Find the measure of the 3 angles.

3) Find the value of *x*:

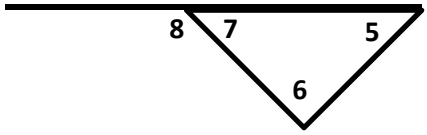


4)



Given: $m\angle 1 = 33$
$m\angle 2 = x$
$m\angle 4 = 113$
Find the m<2 = _____
m<3 = _____

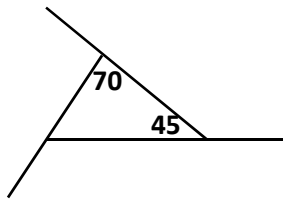
5)



Given: m<5 = 4x
m<6 = 3x + 8
m<8 = 113
Find the m<5 = _____ m <6 = _____
m <7 = _____ m <8 = _____

6) In ΔABC, $m\angle A = x$, $m\angle B = x + 30$, and $m\angle C = 2x - 10$. Find each angle.
[b] Next find the measure of each of the three exterior angles of the triangle.

7) Two angles of a triangle measure 45º and 70º.
[a] Find the missing angle of the triangle.

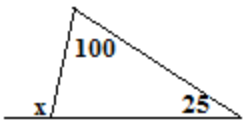


Lesson 7: Classwork/Homework

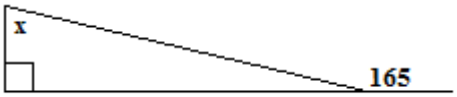
1) The measures of the angles of a triangle are represented by $2x$, $3x$, and x. Find the measure of each angle.

2) Tell whether a triangle can have the given angle measures. If not, change the first angle measure so that the three angles WILL form a triangle.
115.1º, 47.5º, 93º

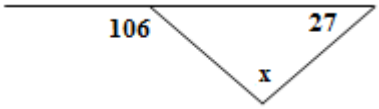
3) Solve for x:



4) Solve for x:

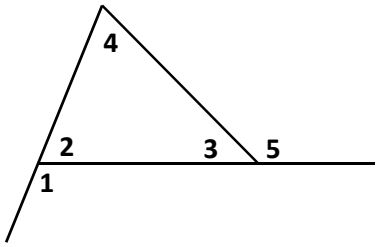


5) Find the value of x:



Find: m<3 =_____

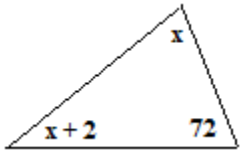
6)



Given: m<1 = 105
m<4 = 34

m<2 = _____
m<5 = _____

7) Solve for x:



8) Which transformation does *not* preserve size?_____

9) Simplify: $8^5 \div 8^{-2}$ _____

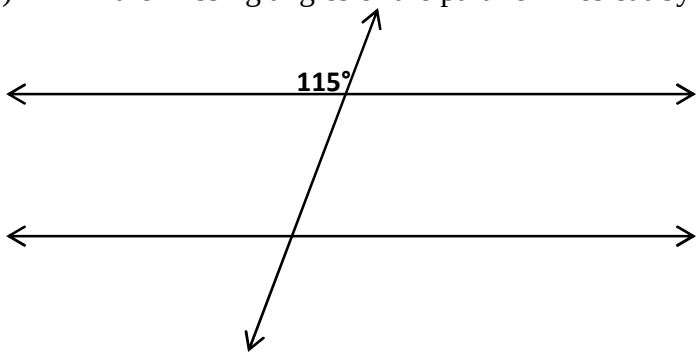
10) State the number of solutions: $3x + 2 = 3x - 2$

11) State the number of solutions: $5x + 3 = 10x + 6$

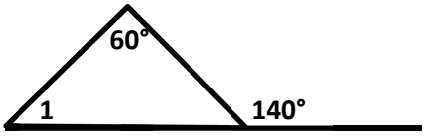
Lesson 8
Parallel Lines and Triangle Angles

Review Work: (Not drawn to scale)

1) Fill in the missing angles of the parallel lines cut by a transversal:



2) Find the measure of <1:

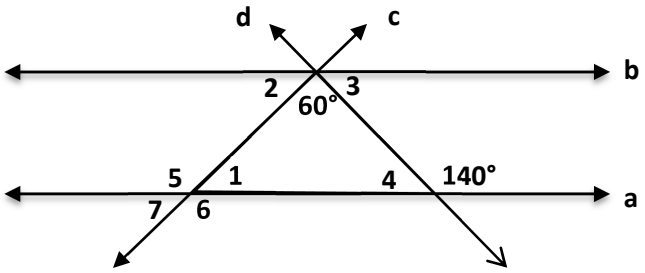


3) The sum of the interior angles of a triangle is _____ degrees.

4) The sum of two supplementary angles is _____ degrees.

Examples: (Not Drawn to Scale)

5) Line a is parallel to line b, find the following:



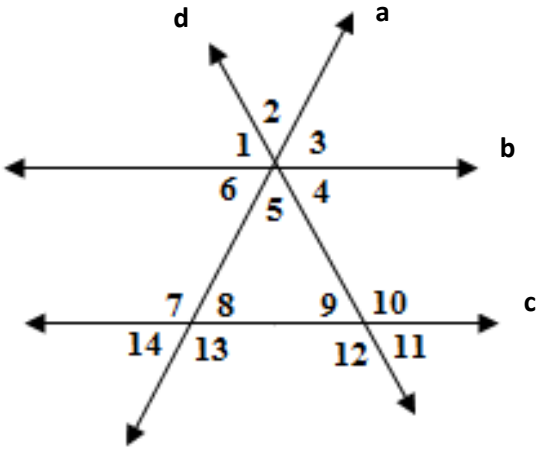
m<1 = _____ *m<5* = _____

m<2 = _____ *m<6* = _____

m<3 = _____ *m<7* = _____

m<4 =_____

6) Line b is parallel to line c, if $m\angle 1 = 60^{\circ}$ and $m\angle 3 = 50^{\circ}$, then:



$m\angle 1$ = _____ $m\angle 8$ = _____

$m\angle 2$ = _____ $m\angle 9$ = _____

$m\angle 3$ = _____ $m\angle 10$ =_____

$m\angle 4$ = _____ $m\angle 11$ =_____

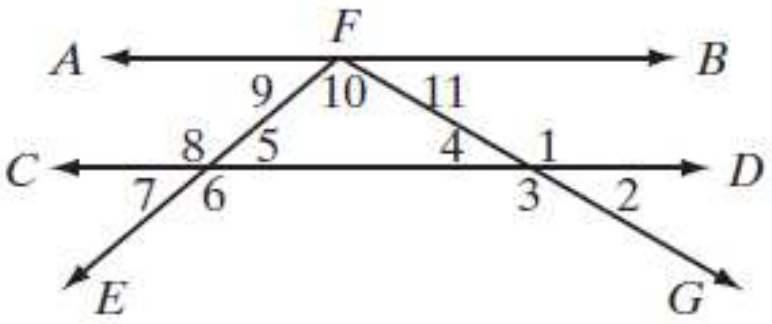
$m\angle 5$ = _____ $m\angle 12$=_____

$m\angle 6$ = _____ $m\angle 13$ =_____

$m\angle 7$ = _____ $m\angle 14$ = _____

Try These:

1) If Line AB is parallel to line CD, m<5 = 40 and m<4 = 30, find the measures of the other angles in the figure.



$m\angle 1$ = _____ $m\angle 8$ = _____

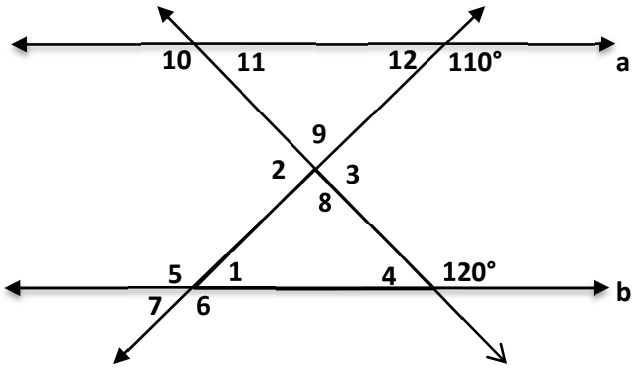
$m\angle 2$ = _____ $m\angle 9$ = _____

$m\angle 3$ = _____ $m\angle 10$ =_____

$m\angle 6$ = _____ $m\angle 11$ =_____

$m\angle 7$ = _____

2) Given line a is parallel to line b:
Find the measures of the following angles:



$m\angle 1$ = _____ $m\angle 7$ = _____

$m\angle 2$ = _____ $m\angle 8$ = _____

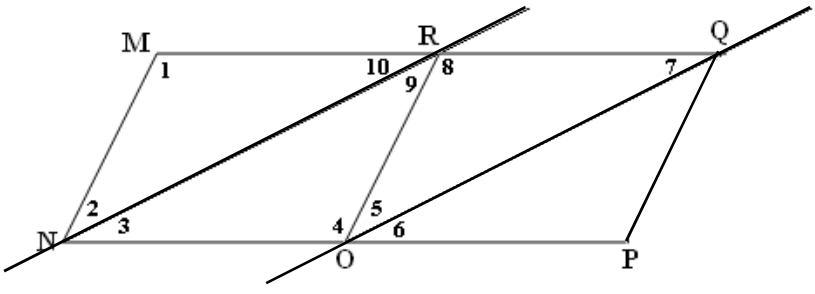
$m\angle 3$ = _____ $m\angle 9$ =_____

$m\angle 4$ = _____ $m\angle 10$ =_____

$m\angle 5$ = _____ $m\angle 11$=_____

$m\angle 6$ = _____ $m\angle 12$ = _____

3) Given parallelogram *MNOR*, if $m\angle 1$ =80º, and $m\angle 2$ =60º, find the measures of all of the other angles if line NR is parallel to line OQ. (Remember opposite angles in a parallelogram are congruent)



$m\angle 3$ = _____ $m\angle 7$ = _____

$m\angle 4$ = _____ $m\angle 8$ = _____

$m\angle 5$ = _____ $m\angle 9$ =_____

$m\angle 6$ = _____ $m\angle 10$ =_____

Lesson 8: Classwork/Homework

1) If $m\angle 1 = 70^o$ and $m\angle 6 = 80^o$, then:

$m\angle 1 =$ _70 º_ $m\angle 11 =$ _30 º_

$m\angle 2 =$ _____ $m\angle 12 =$ _____

$m\angle 3 =$ _____ $m\angle 13 =$_____

$m\angle 4 =$ _____ $m\angle 14 =$_____

$m\angle 5 =$ _____ $m\angle 15 =$_____

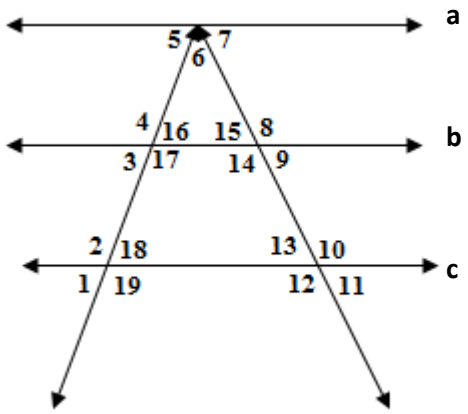
$m\angle 6 =$ _80º_ $m\angle 16 =$_____

$m\angle 7 =$ _____ $m\angle 17 =$ _____

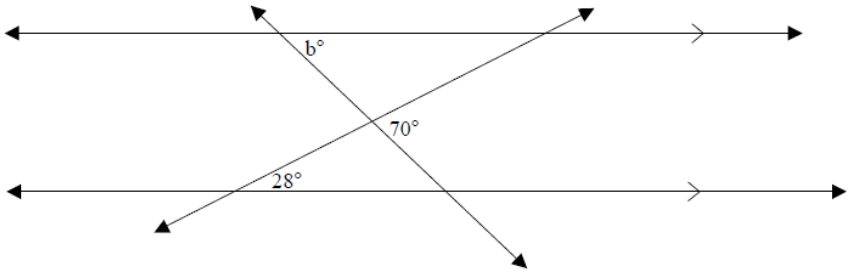
$m\angle 8 =$ _____ $m\angle 18 =$ _____

$m\angle 9 =$ _____ $m\angle 19 =$ _____

$m\angle 10 =$ _____

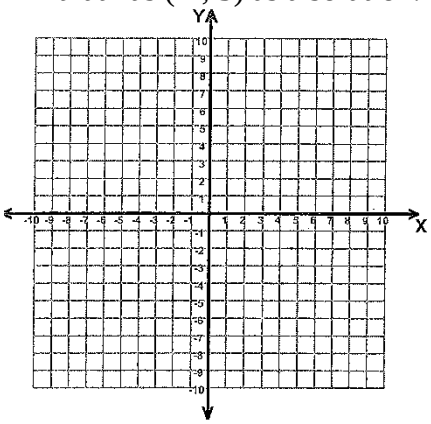


2) Find the measure of angle b:

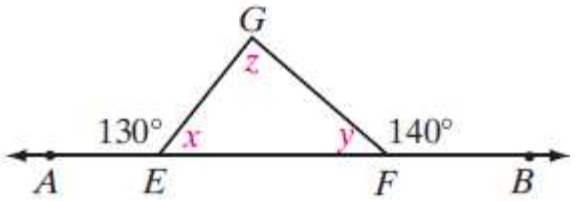


b = _____

3) Draw a system of equations that has (-2, 3) as a solution.



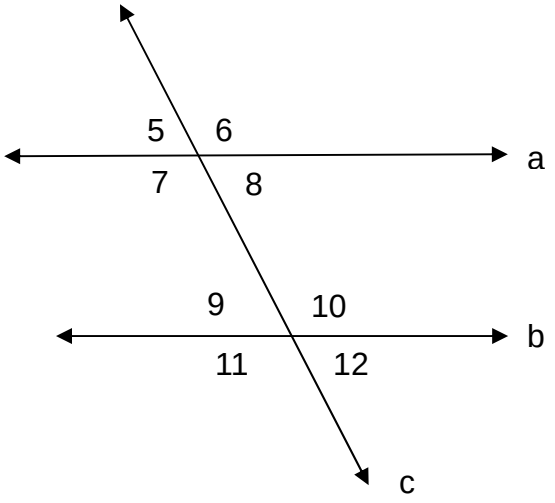
4) Find the measure of angles x, y and z.



Name_____ **8R Unit 9 Review**

1) What is the complement of a 42° angle? _____
2) What is the supplement of a 42° angle? _____
3) What is the complement of a 20x degree angle? _____
4) What is the supplement of a 20x degree angle? _____

Use the diagram to the right to answer 5 - 11:
State two angles that are:



5) Corresponding angles:_____

6) Alternate Interior angles:_____

7) Alternate Exterior angles:_____

8) Vertical angles:_____

9) Supplementary angles:_____

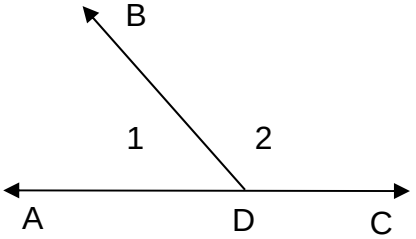
10) What is the name of the transversal:_____

11) If m<7 = 113 degrees, find:

m<5 = _____ m<6 = _____ m<8 = _____ m<9 = _____

m<10 = _____ m<11 = _____ m<12 = _____

Use the diagram at the right to answer 12 - 15:



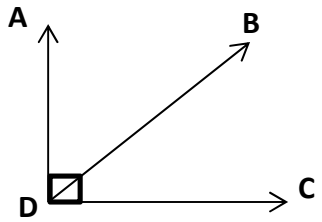
12) What type of angles are 1 and 2? _____

13) <ADB + <BDC = _____ °

14) If <ADB = 57°, find the measure of <BDC

15) Given: m <1 : m <2 = 4:5
Find: m<ADB

Use the diagram at the right to answer 16 - 19:



16) What type of angles are <ADB and <BDC _____

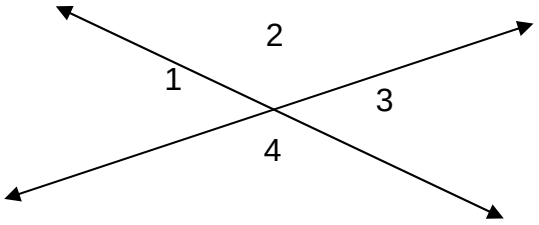
17) <ADB + <BDC = _____ °

18) If <ADB = 38°, find the measure of <BDC

19) Given: <ADB = x – 10
<BDC = 3x + 20

Find: m<BDC

Use the diagram at the right to answer 20 – 24:



20) What type of angles are <1 and <3? _____

21) What type of angles are <1 and <2? _____

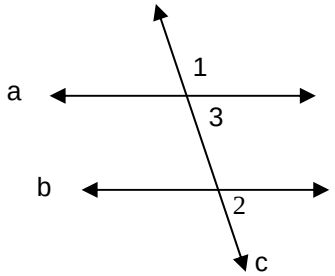
22) m<1 + m<2 = m<3 + _____

23) Given: m <1 = 30°

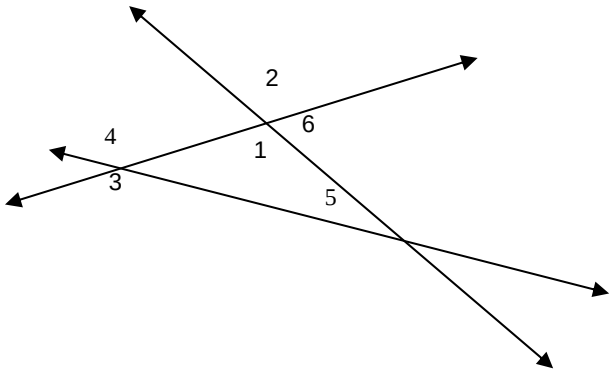
Find m <2 _____ m <3 _____ m <4 _____

24) Given: m<1 = 2x – 50
m<3 = x + 10
Solve for x

25) Given: line a and b are parallel.
m<1 = 3x + 10
m<2 = 2x + 40
a) Solve for x
b) Find m < 3



Use the diagram at the right to answer 26 – 29:



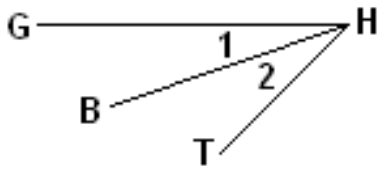
26) Name a pair of congruent angles.

27) Which angle is congruent to <2? _____

28) Which angle is supplementary to <6? _____

29) m<1 + m<5 = m<_____

Use the diagram at the right to answer 30 – 33:



30) Use three letters to name angle 1:_____

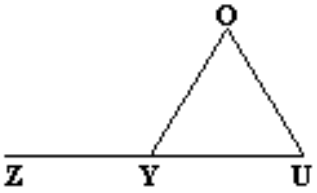
31) Use three letters to name angle 2:_____

32) Given $m\angle 2 = 56^{\circ}$,
$m\angle GHT = 87^{\circ}$
Find $m\angle 1$.

33) Given $m\angle 2 = 3x + 5$,
$m\angle 1 = 2x + 35$
$m\angle GHT = 80$
Find $m\angle 1$.

Use the diagram at the right to answer 34 - 35

34) In triangle YOU, $m\angle OYZ = 108^{\circ}$ and $m\angle O = 48^{\circ}$. What is the m<U?



35) In triangle YOU, m<O = 3x + 15, m<U = 2x + 10 and the measure of <OYZ = 100 °, solve for x.

---

36) Find the measure of the third angle of a triangle if the other two measure 40 ° and 99 °.

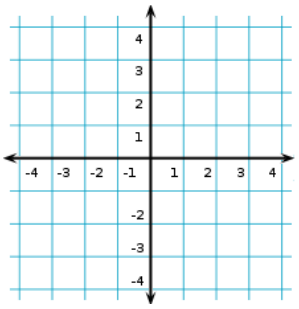
---

37) The three angles of a triangle are in the ratio of 2:4:3. Find the measure of the smallest angle.

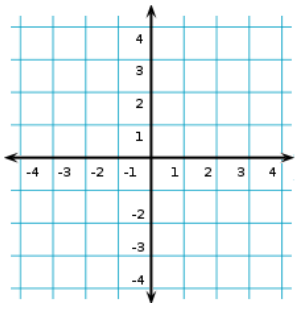
Unit 8 Review:

38) Graph the transformation, label each transformation with the letters **A – C and A'-C'** and list the coordinate.

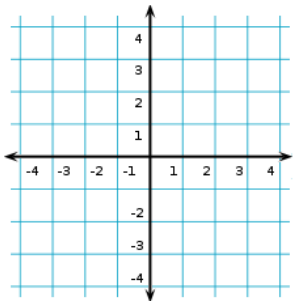
A. Reflect A(-2,1) in the *x*-axis



B. Rotate B(3,4) 90 degrees clockwise



C. Dilate C(-1,-2) if k = 2



Unit 7 Review:

State the number of solutions each of the pair of equations have.(No solutions, One Solution or infinite solutions):

39) $y = 3x + 9$
$y = 3x + 10$

40) $2x + 3y = 24$
$5x - 3y = 10$

41) $y = 5x - 6$
$2y = 10x - 12$

Unit 5 and 6 Review:

42) What is the slope and y intercept of the following lines:

A) $y = 2x - 8$ B) $y = \frac{1}{2}x - 5$ C) $y = 2x$

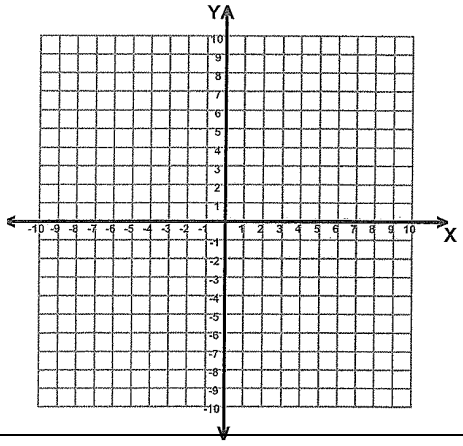
43) Write the equation of the line:

x	y
2	7
4	11
6	15
20	

Unit 4 Review:

44) a) Graph the system of equations:
$y = 3$
$x = -4$

b) What is the solution?_____



Unit 3 Review: Simplify. Rewrite using all positive exponents.

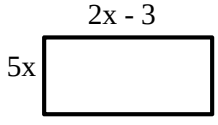
45) $6x^0$ 46) 6^0 47) $\frac{6}{0}$ 48) $\frac{0}{6}$ 49) $5^{-2}x5^2$

Unit 1 and 2 Review:

50) Simplify $10 - 3 \times 4 - 5^3$

51) Convert 59°F into Celsius using the formula $C = \frac{5}{9}(F - 32)$.

52)



a) Find the area.

b) Find the perimeter

Unit 10

Geometry

	Date	Lesson	Topic
		1	Name 2D Shapes and Find Area
		2	Area of Composite Figures
		3	3D Shapes and Slices
		4	Surface Area of Prisms and Pyramids
		5	Volume of Cubes, Prisms, Cone, Cylinders and Spheres
		6	Volume and Surface Area
			Quiz
		7	Use a Protractor to Draw and Measure Angles
		8	Draw Quadrilaterals and Triangles Given their Sides and Angles
		9	Draw Triangles and Determine Uniqueness
			Review
			Test

Grade 8 Mathematics Reference Sheet

CONVERSIONS

1 inch = 2.54 centimeters
1 meter = 39.37 inches
1 mile = 5,280 feet
1 mile = 1,760 yards
1 mile = 1.609 kilometers

1 kilometer = 0.62 mile
1 pound = 16 ounces
1 pound = 0.454 kilogram
1 kilogram = 2.2 pounds
1 ton = 2,000 pounds

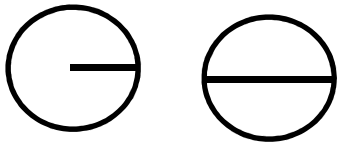
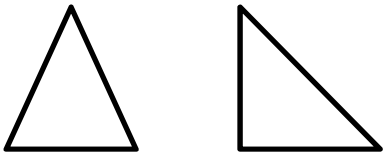
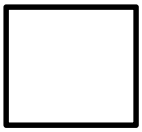
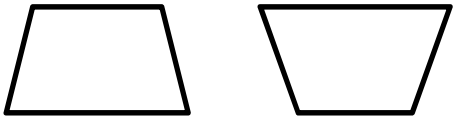
1 cup = 8 fluid ounces
1 pint = 2 cups
1 quart = 2 pints
1 gallon = 4 quarts
1 gallon = 3.785 liters
1 liter = 0.264 gallon
1 liter = 1,000 cubic centimeters

FORMULAS

Triangle	$A = \frac{1}{2}bh$
Parallelogram	$A = bh$
Circle	$A = \pi r^2$
Circle	$C = \pi d$ or $C = 2\pi r$
General Prisms	$V = Bh$
Cylinder	$V = \pi r^2 h$
Sphere	$V = \frac{4}{3}\pi r^3$
Cone	$V = \frac{1}{3}\pi r^2 h$
Pythagorean Theorem	$a^2 + b^2 = c^2$

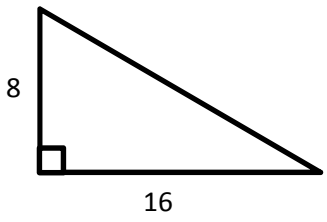
Lesson 1
Name 2D Shapes and Find Area

Vocabulary: **Area Formulas**

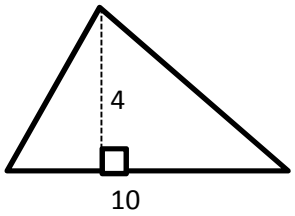
Circle • Radius • Diameter • 	$C = \pi d$ $A = \pi r^2$
Triangle 	$A = \frac{1}{2}\ bh$ or $A = \frac{bh}{2}$
Square 	$A = s^2$
Rectangle 	$A = lw$
Parallelogram 	$A = bh$
Trapezoid 	$A = \frac{1}{2}\ h(b + b)$ or $A = \frac{h(b + b)}{2}$

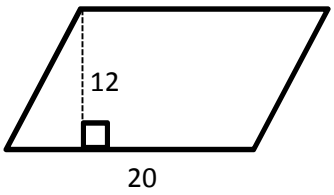
Examples:
Find the Area

1)

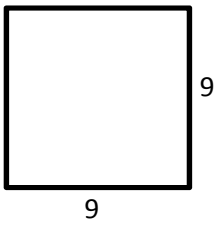


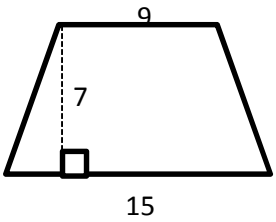
2)



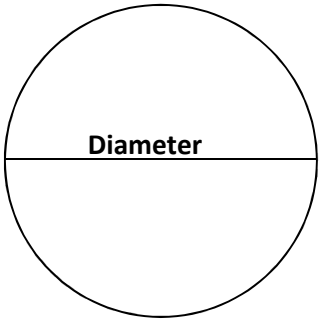
3) 

4) 

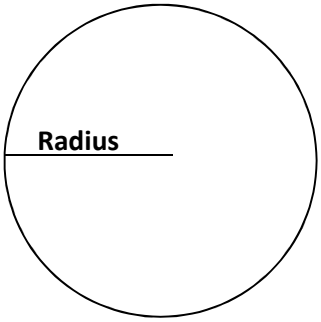
5) 

6) 

Diameter - A line segment with endpoints on the circle that passes through the center of the circle



Radius - A line segment that extends from the center of a circle to any point on the circle



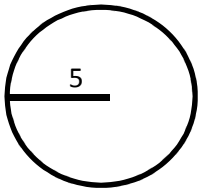
****The radius of a circle is half of the diameter****

Find the diameter:

7) r = 12 d = ____ 8) r = 10 d = ____ 9) r = 5 d = ____ 10) r = 125 d = ____

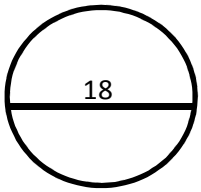
Find the radius:

11) d = 18 r = ____ 12) d = 100 r = ____ 13) d = 7 r = ____ 14) d = 14 r = ____

15) 

Area in terms of p i=_____

Area to the nearest tenth =_____

16) 

Area in terms of pi = _____

Area to the nearest tenth = _____

Find the missing measure.

17) l = 5m
w =
A = 60 m^2

Find the missing dimension, given the area: (Hint Draw a picture)

18) A piece of paper has a length of 16 inches and an area of 48 square inches. Find the width.

---

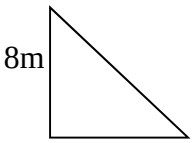
19) The area of a square is 400 square units. What is the distance of each side?

---

20) The area of a rectangle is 240 square units. If the length of the rectangle is 24 units, what is the width?

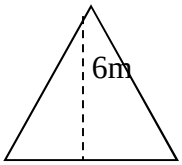
Try These: Find the area

1)

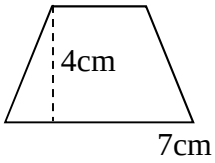


2)

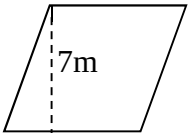
3)



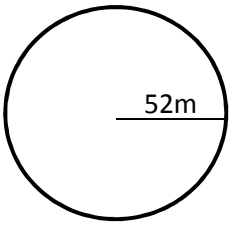
4)



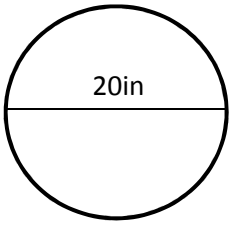
5)



6) (to the nearest tenth)



7) (in terms of pi)



8) The area of a square is 169 square units. What is the distance of each side?

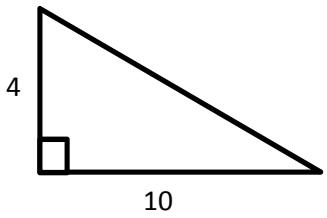
9) The area of a rectangle is 120 square units. If the length of the rectangle is 5 units, what is the width?

10) A trapezoid has an area of 600 square feet. The measures of the bases are 12 units and 18 units, respectively. What is the height of this trapezoid?

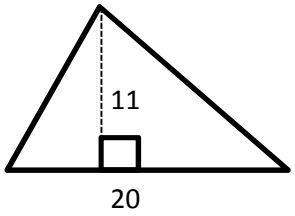
Lesson 1: Classwork/Homework

Find the Area of each figure:

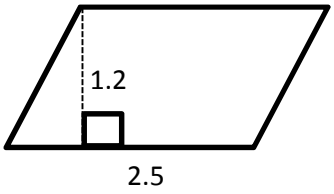
1)



2)

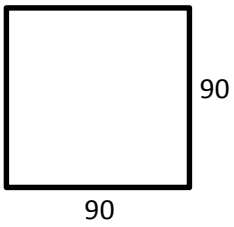


3)

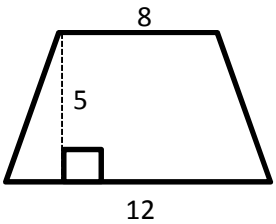


4)

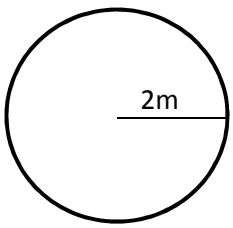
5)



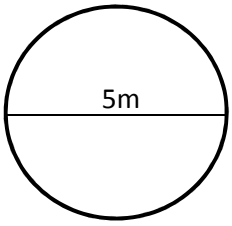
6)



7) Find the area of the circle.
Leave your answer in terms of pi.



8) Find the area of the circle.
Round to the nearest tenth.



Find the missing dimension, given the area:

9) The area of a parallelogram is 100 square feet. If the height of this figure is 25 feet, how long is the base?

10) A triangular monument is being constructed in a park. The total area of the monument is 900 square units, and the base is 30 feet wide. How tall is the monument?

11) A rectangular room has an area of 600 square feet. The length of the room is 30 feet, what is the width?

12) What is the area of a parallelogram with a height of 24 feet and a base of 10 feet?

13) The area of a triangle is 420 square units. If the base is 21 units, what is the height?

14) A rectangular playground is 85 feet long and 60 feet wide. What is the area of the playground?

A) 290 ft^2 B) 2, 550 ft^2 C) 510 ft^2 D) 5,100 ft^2

15) Which of the figures below have the same area?

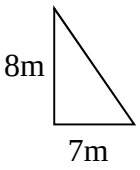


Figure 1

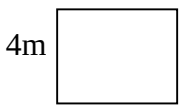


Figure 2

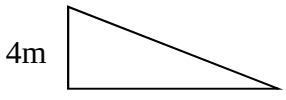


Figure 3

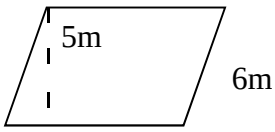


Figure 4

A) Figures 1 and 2 B) Figures 2 and 3 C) Figures 2 and 4 D) Figures 3 and 4

Lesson 2

Area of Composite Figures

Vocabulary:

Composite Figure:_____

Steps: To find the Area of a Composite Figure:

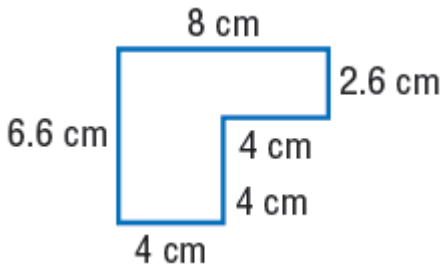
1 - Break the figure down into shapes with areas you know.

2 - Find the area of each shape.

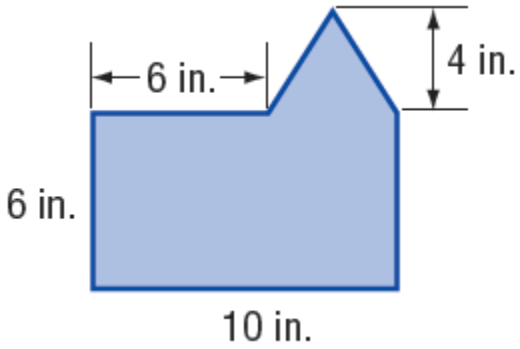
3 - **Add** the area of each shape.

Examples:

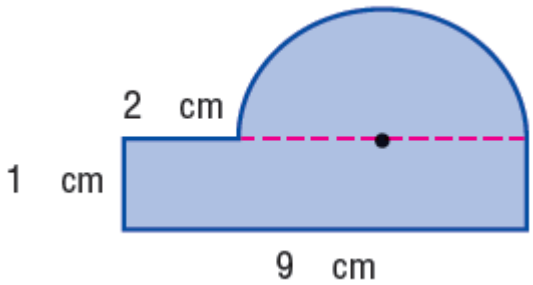
1)



2)

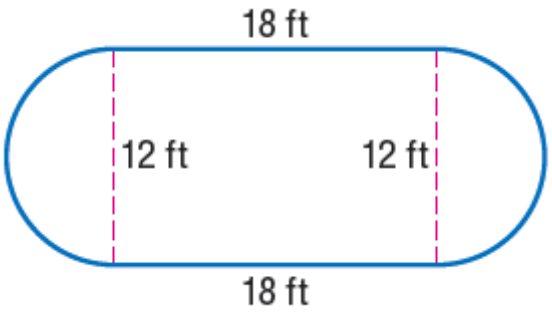


3)

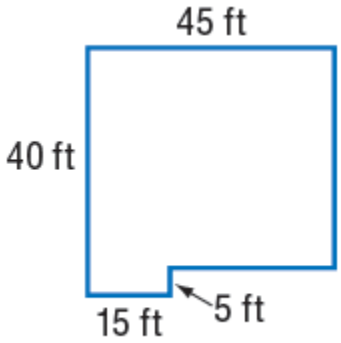


Try These: Find the area of each composite figure.

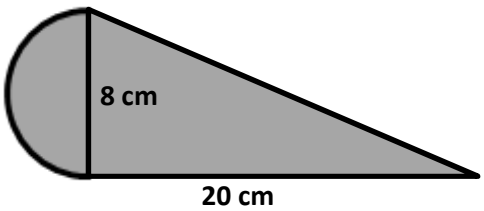
1)



2)



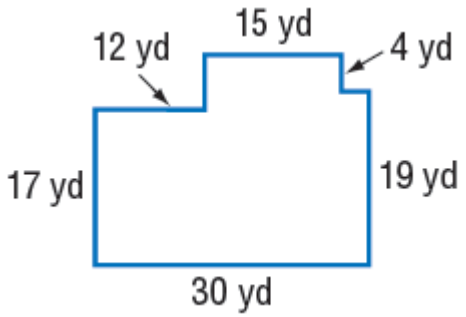
3)



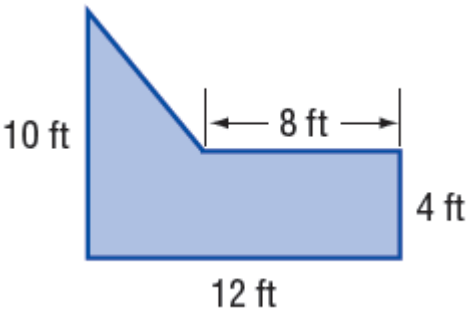
Lesson 2: Classwork/Homework

Find the area of each composite figure:

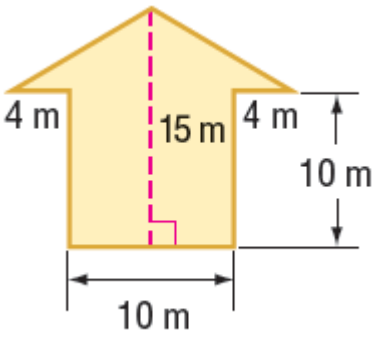
1)



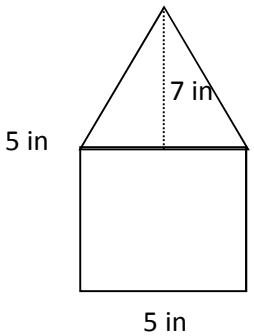
2)



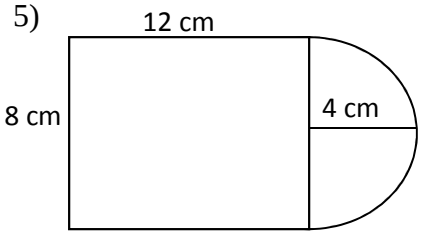
3)



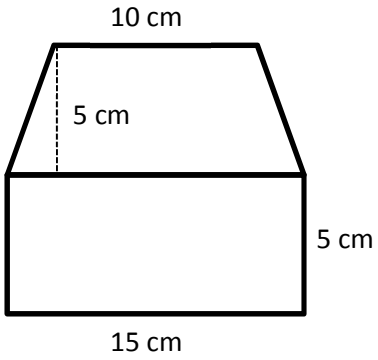
4)



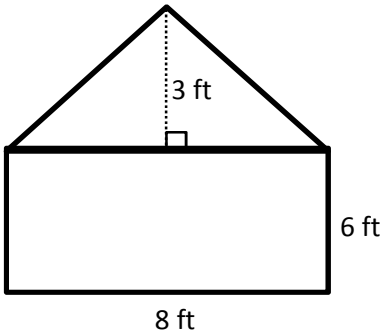
5)


12 cm
8 cm
4 cm

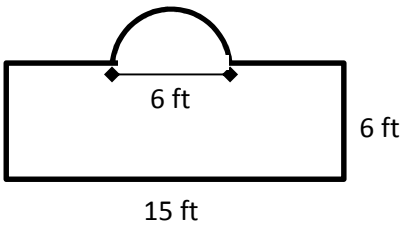
6)


10 cm
5 cm
5 cm
15 cm

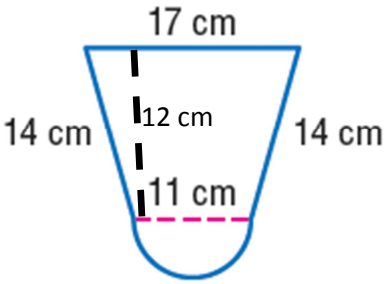
7)


3 ft
6 ft
8 ft

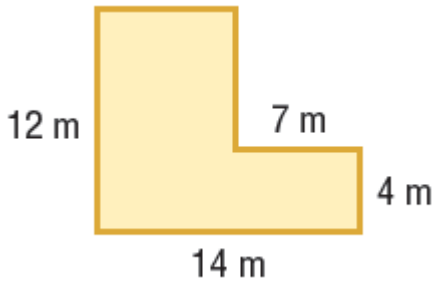
8)


6 ft
6 ft
15 ft

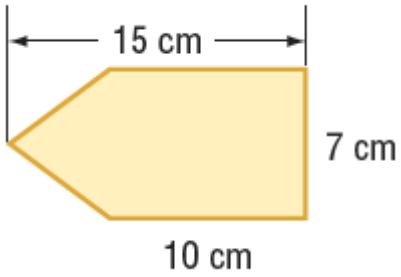
9)


17 cm
14 cm
12 cm
14 cm
11 cm

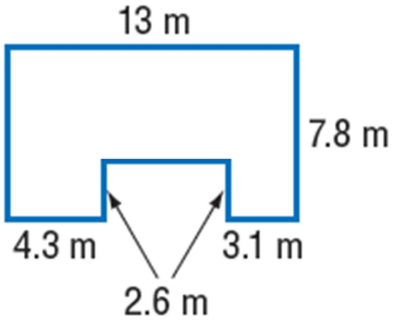
10)


12 m
7 m
4 m
14 m

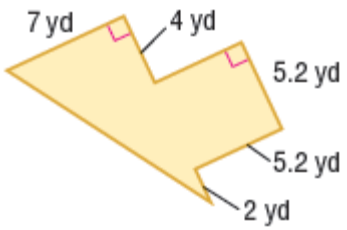
11)


15 cm
7 cm
10 cm

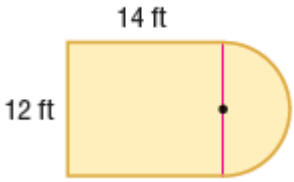
12)


13 m
7.8 m
4.3 m
3.1 m
2.6 m

13)


7 yd
4 yd
5.2 yd
5.2 yd
2 yd

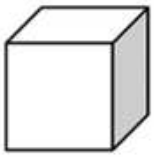
14)


14 ft
12 ft

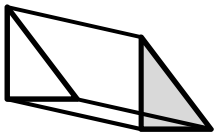
Lesson 3
3D Shapes and Slices

Vocabulary:

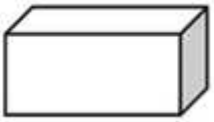
Cube



Right Triangular Prism

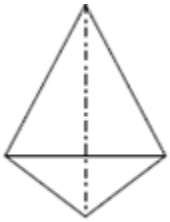


Rectangular Prism



Rectangular Pyramid

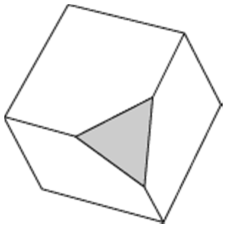
Triangular Pyramid



Cylinder **Cone** **Sphere**

Cross Section – A cross section is the face you get when you make a slice through a solid. It is like a view into the inside of something made by cutting through it.

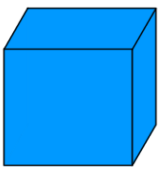
This is a cross-section of a piece of celery!



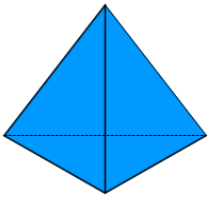
Examples:

Look at the 3-D shapes below. Write the name of each one and then list what 2D shapes you would need to make each one.

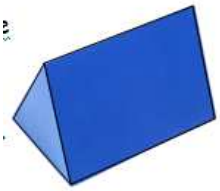
1)

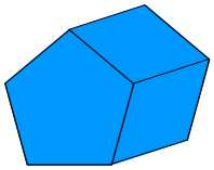


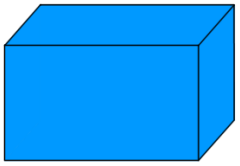
2)

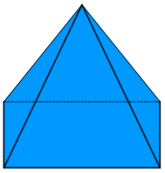


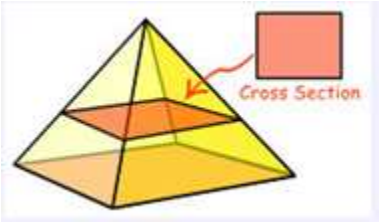
3)



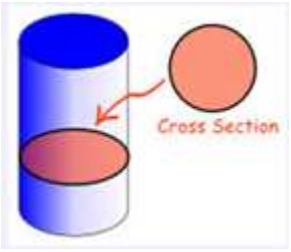
4) 

5) 

6) 



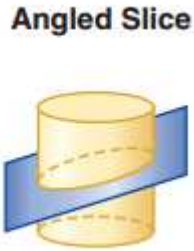
The cross section of a rectangular pyramid is a _____

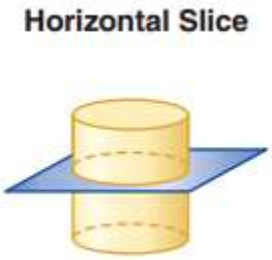


The cross section of a circular cylinder is a _____

Identifying Cross-Sections:

7) 

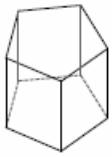
8) 

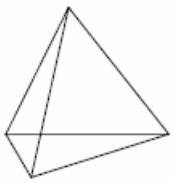
9) 

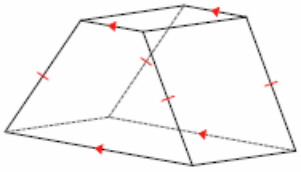
What shape is the cross section?

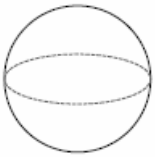
_____ _____ _____

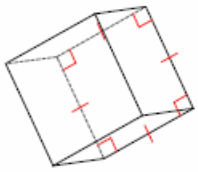
Try These: Name each solid

1) 

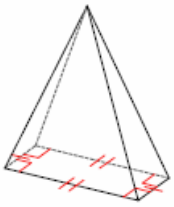
2) 

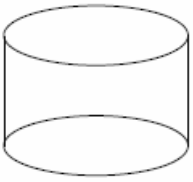
3) 

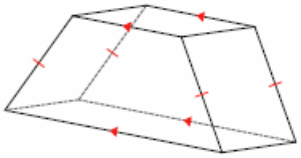
4) 

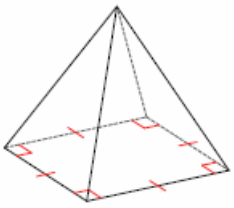
5) 

6) 

7) 

8) 

9) 

10) 

What shape is the cross section?

11) 

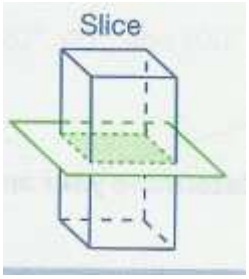
12) 

13) 

14) 

Draw the cross section of given slice and then name the shape of the slice.

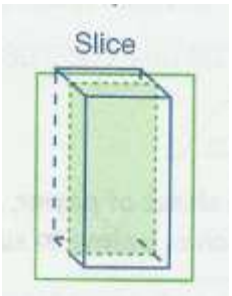
15)



Draw:

Name:_____

16)

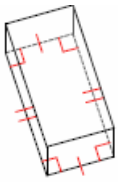


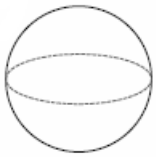
Draw:

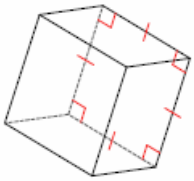
Name:_____

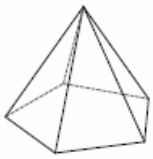
Lesson 3: Classwork/Homework

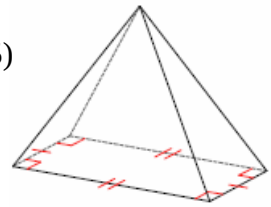
What are the names of the shapes below?

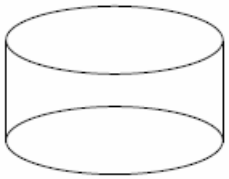
1) 

2) 

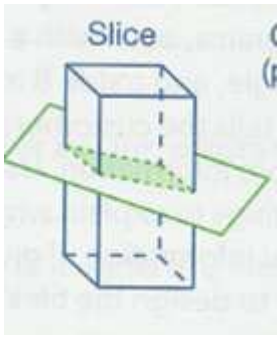
3) 

4) 

5) 

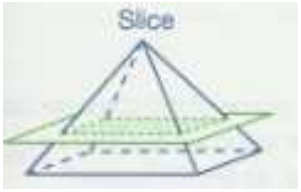
6) 

Draw the cross section of given slice and then name the shape of the slice.

6) 

Draw:

Name:_____

7) 

Draw:

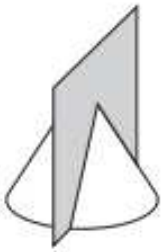
Name:_____

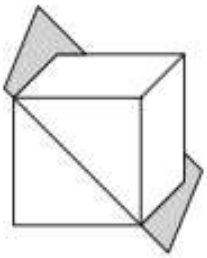
8) 

Draw:

Name:_____

Name the shape resulting from each cross-section.

9) 

10) 

11) 

Choose the correct cross-sections of the cube.

12) Triangle (not equilateral) _____

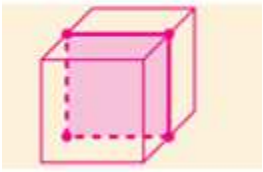
13) Trapezoid _____

14) Equilateral Triangle _____

15) Square _____

A 

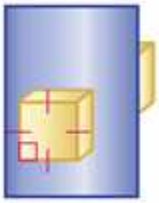
B 

C 

D 

What shape is the cross section?

16) 

17) 

18) 

19) 

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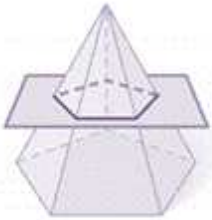
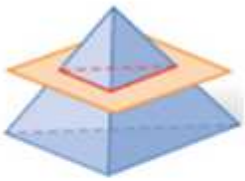
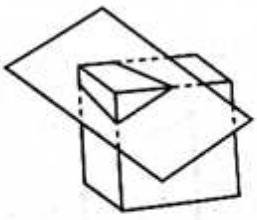
20) 

21) 

22) 

23) 

Review Work:

24) What is the slope of the line that passes through the points (-6,1) and (4,- 4)?

25) Solve: $5p - 1 = 2p + 20$

26) Simplify: $(3x^2)^3$?

27) Simplify: $\frac{27x^{18}y^5}{9x^6y}$

28) Solve the following system of equations algebraically:

$3x + 2y = 4$
$4x + 3y = 7$

29) How many solutions in the system? $x + 2y = 9$ and $x - y = 3$?

30)What is the product of 12 and 4.2 × 106 expressed in scientific notation?

31) Solve for x: $\frac{3}{5}(x + 2) = x - 4$

32) The area of a circle is 144π. What is the diameter of the circle?

Lesson 4
Surface Area of Prisms and Pyramids

Vocabulary:

The **Surface Area** of a solid is the sum of the areas of all its surfaces.

Volume is the number of units, or cubic units, needed to fill a solid

Surface Area vs. Volume:

1. Determining the amount of water needed to fill a pool.

[a] Surface area or volume?

[b] Name the 3-D figure that the pool resembles

2. Wrapping a present

[a] Surface area or volume?

[b] Name the 3-D figure that the box resembles

3. Determining the amount of paint needed to paint a house.

[a] Surface area or volume?

[b] Name the 3-D figure that the roof resembles

4. Determining the amount of paint inside a can of paint.

[a] Surface area or volume?

[b] Name the 3-D figure that the can of paint resembles

5. The amount of ice cream inside a container.

[a] Surface area or volume?

[b] Name the 3-D figure

---

6. Determining the amount of wall paper needed for a room.

[a] Surface area or volume?

[b] Name the 3-D figure

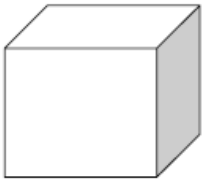
Formulas for Surface Area:

Cylinder: (Right Circular Cylinder)

$SA = 2\pi rh + 2\pi r^2$

Cube

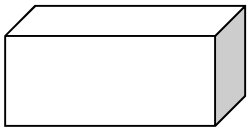
- Add the areas of 6 sides



Name the shape of the 6 Sides

Rectangular Prism

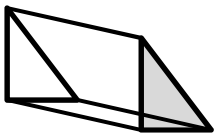
- Add the areas of 6 sides



Name the shape of the 6 Sides

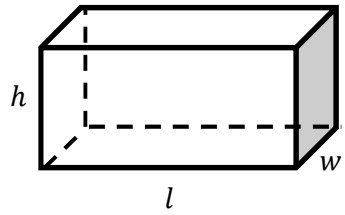
Right Triangular Prism

- Add the areas of 5 sides



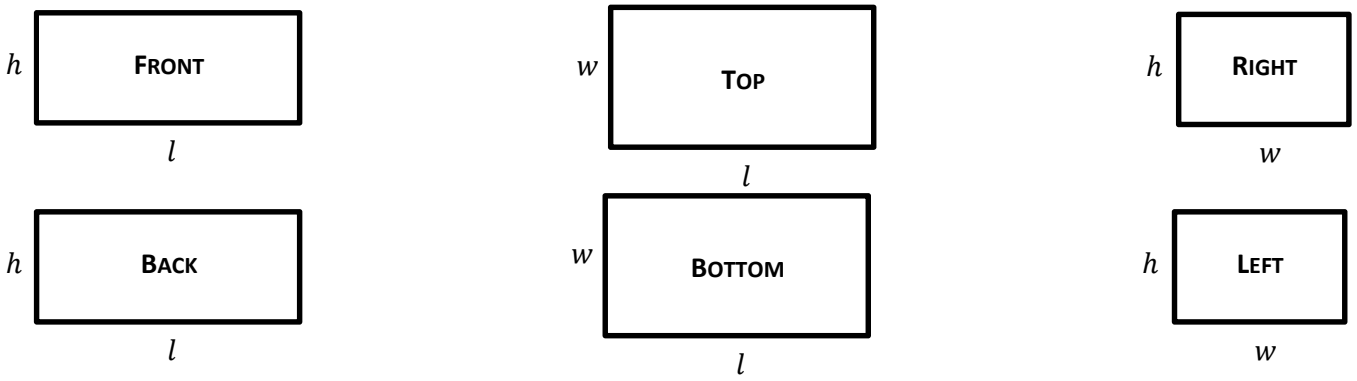
Name the shape of the 5 Sides

SURFACE AREA OF A RECTANGULAR PRISM

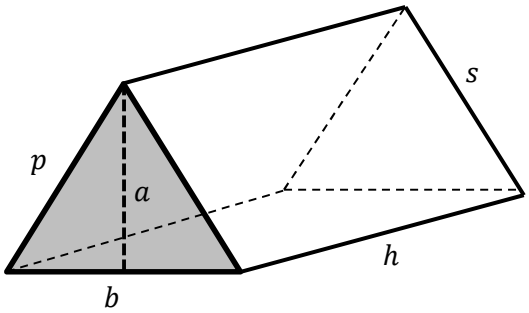


ADDING THE AREAS OF ALL THE BASES, WE GET:

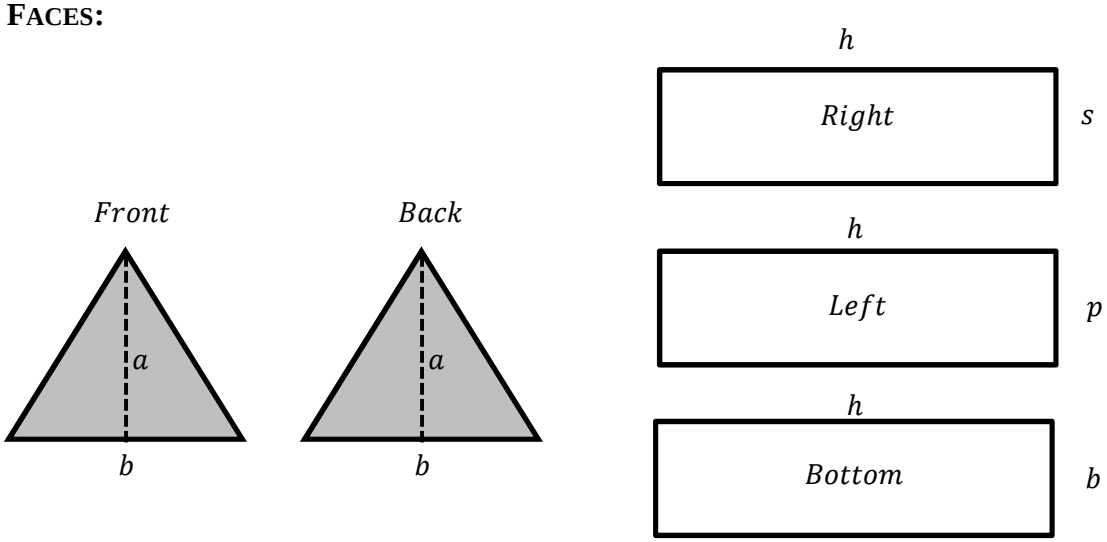
FACES:



SURFACE AREA OF A TRIANGULAR PRISM



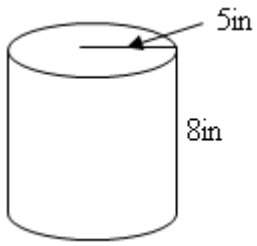
FACES:



Examples:

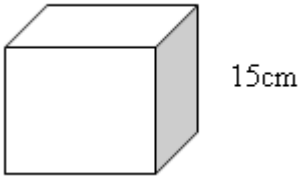
Find the Surface Area:

1)



Step 1: Write Down Formula from Reference Sheet
Step 2: Plug in the Numbers
Step 3: Solve

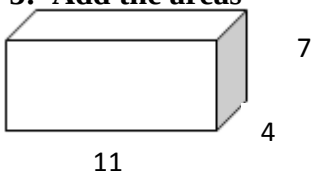
2) Find the Surface Area:
Step 2: Find the area of each
Step 3: Add the areas



Step 1: List the six sides

Sides	Shape	Formula	Solution
1			
2			
3			
4			
5			
6			

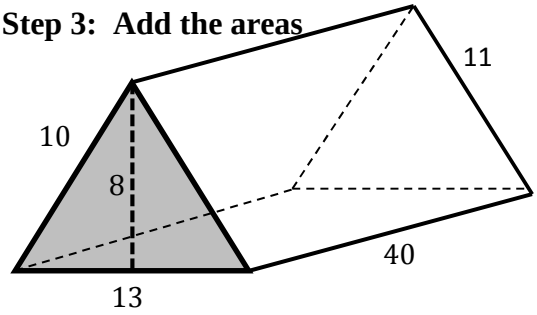
3) Find the Surface Area:
Step 2: Find the area of each
Step 3: Add the areas



Step 1: List the six sides

Sides	Shape	Formula	Solution
1			
2			
3			
4			
5			
6			

4) Find the Surface Area:
Step 2: Find the area of each
Step 3: Add the areas



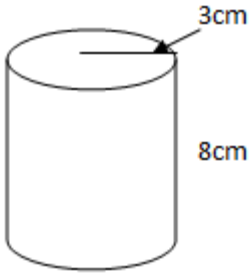
Step 1: List the five sides

Sides	Shape	Formula	Solution
1			
2			
3			
4			
5			

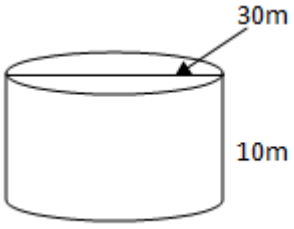
Try These:

Find the Surface Area of each figure:

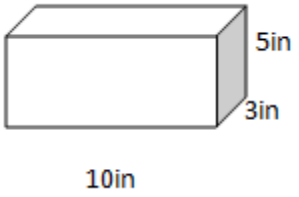
1) in terms of π



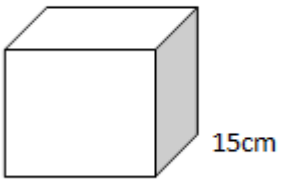
2) to the nearest tenth



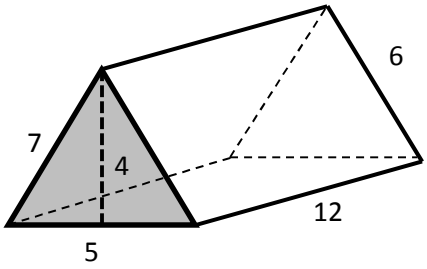
3)



4)



5)

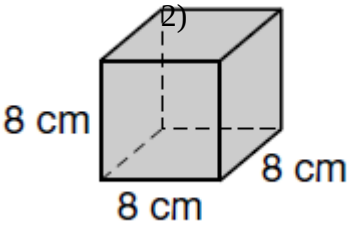


6) A clay jar is 4 inches high and has a diameter of 5 inches. A glaze will go on the outside of the jar. Find the area of the jar that needs to be covered with glaze. Round to the nearest tenth.

Lesson 4: Classwork/Homework

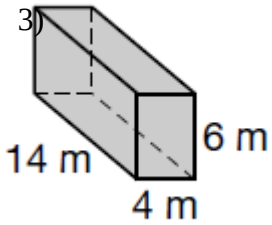
Find the surface area of each figure.

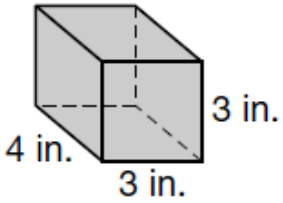
1)



2)

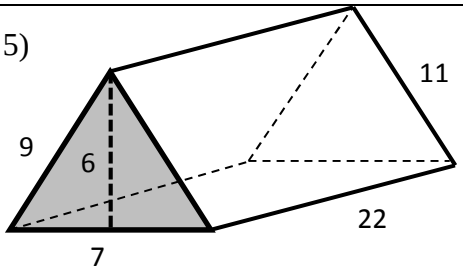
3)



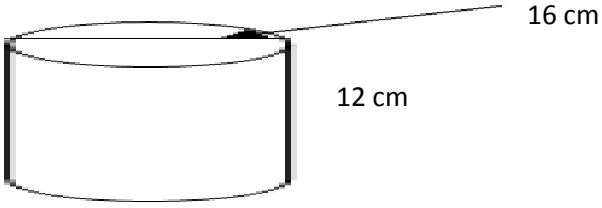


4) Bob wants to display some of his photographs. Which has more surface area, a 4 inch by inch by 4 inch photo cube or a 3 inch by 4 inch by 5 inch prism?

5)

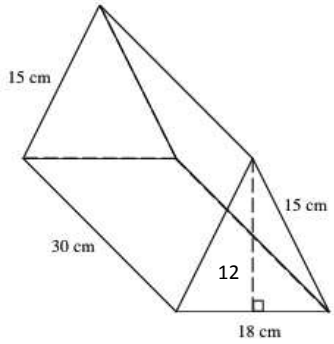


6)

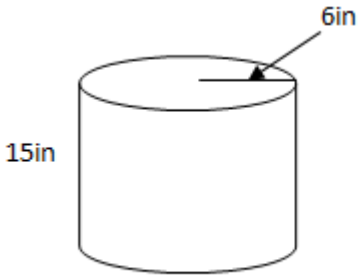


Find the surface area of each figure

7)

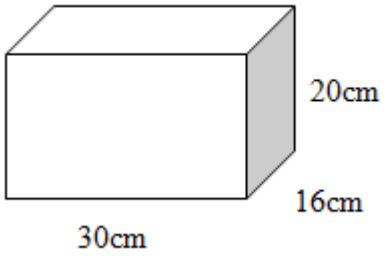


8) in terms of π

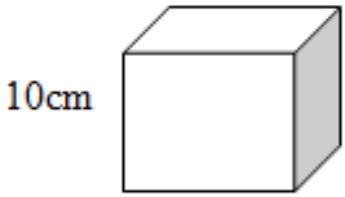


Find the surface area of each figure.

9)



10)



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11) An owner of a prestigious jewelry store sells charm bracelets. They are packaged in boxes that measure 8 cm. by 11 cm. by 2 cm. How much wrapping paper would she need?

a) Sketch a drawing of the box and label its dimensions.

b) Find the surface area of the box.

Lesson 5
Volume of Cubes, Prisms, Cone, Cylinders and Spheres

Vocabulary:

Volume is the number of units, or cubic units, needed to fill a solid

Formulas:

Cylinder (Right Circular Cylinder)

$V = \pi r^2 h$

$V = Bh$

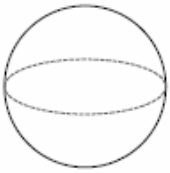
Cone (Right Circular Cone)

$V = \frac{1}{3} B h$

$V = \frac{1}{3} \pi r^2 h$

Sphere

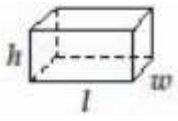
$V = \frac{4}{3} \pi r^3$



Right Rectangular Prism and Cube

$V = lwh$

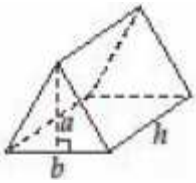
$V = B h$



Right Triangular Prism

$V = \frac{1}{2}$ a b h

$V = B h$



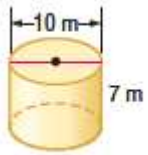
Examples:

Rules for finding volume

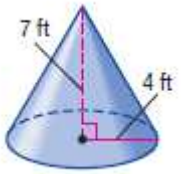
Step 1: Write Down Formula from Reference Sheet
Step 2: Plug in the Numbers
Step 3: Solve

Find the volume of each:

1)



2)



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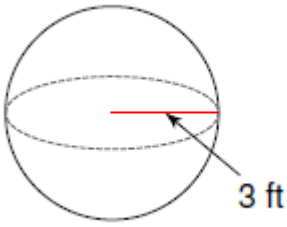
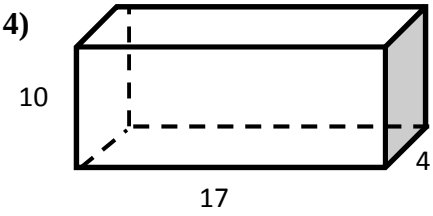
3)



4)



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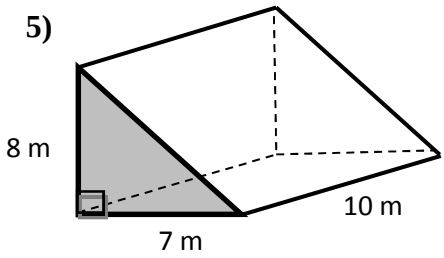
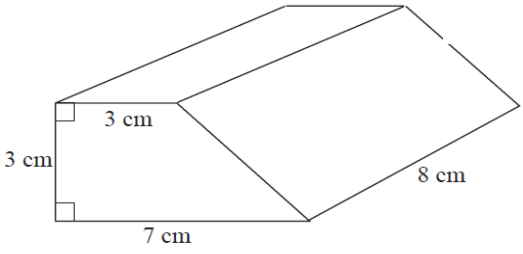
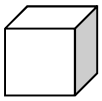
5)



***6) Apply what you know**



Find the missing dimensions using the given information:

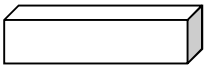
7) 

Volume = 8 m^3

Length = _____

Width = _____

Height = _____

8) 

Volume = 504 in^3

Length = 7 in.

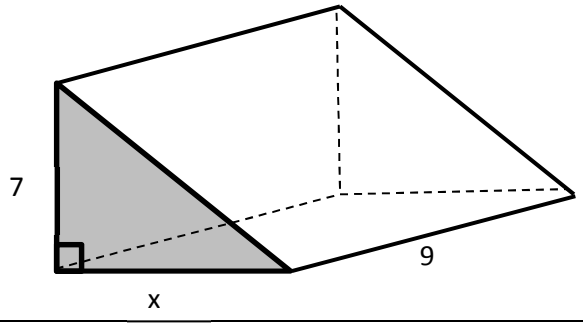
Width = 8 in.

Height = _____

Try These:

Find the missing dimension of each prism.

1) Volume = 165.24 in cubed



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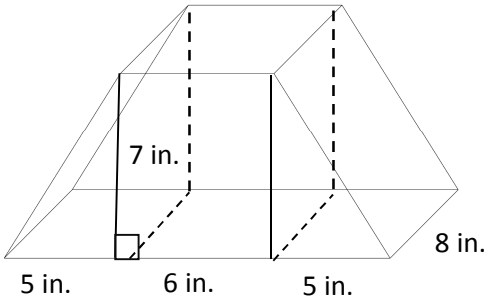
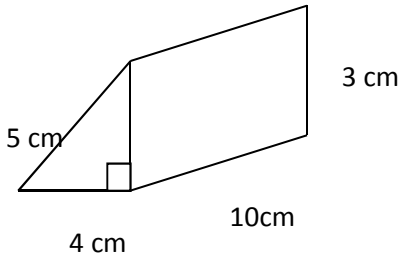
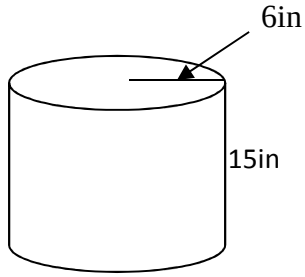
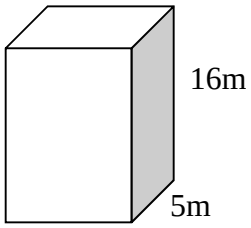
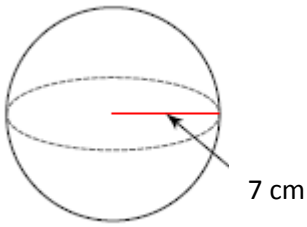
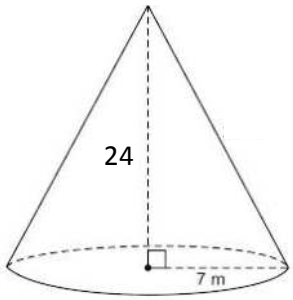
3) The prism shown has a base of a trapezoid. Use your knowledge of volume of prisms to find the volume of the prism.



Lesson 5: Classwork/Homework

Find the volume of each:

1) 	V =
2) 	V =
3) 	V =
4 	
5) 	

6) If the volume of a rectangular prism is $100in^3$. The length is 5in. and the width is 4in. What is the height?

---

7) Soda is sold in aluminum cans that measure 6 inches in height and 2 inches in diameter. How many cubic inches of soda are contained in a full can?(Round answer to the *nearest tenth of a cubic inch*.)

---

8) The smallest object in space that is spherical due to its own gravity is Mimas, one of the moons of Saturn. The radius of Mimas is approximately 200 km. What is the approximate volume of the moon, to the nearest million cubic km?

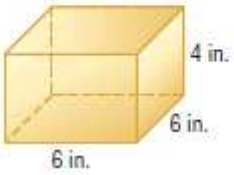
---

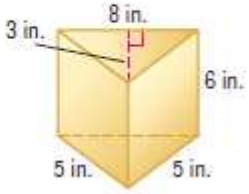
9) How much ice cream can fit inside a cone that has a diameter of 8 centimeters and a height of 9 centimeters?

---

10)

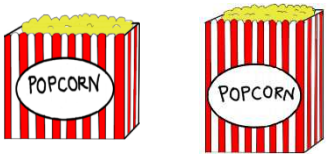
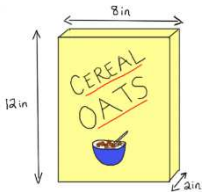
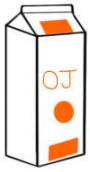
CHALLENGE A candy company sells mints in two different containers. Which container shown below holds more mints? Justify your answer.





Lesson 6
Volume and Surface Area

Determine if you would need to find the surface area, or volume.

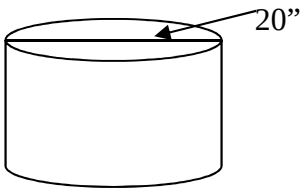
1) Which container will hold more popcorn? 	2) Which gift requires more wrapping paper? 	3) How much soda will fit into this two-liter bottle? 
4) How much cardboard is used to make a box? 	5) How many square feet of fabric were needed to create the tent? 	6) How much orange juice will the carton hold? 

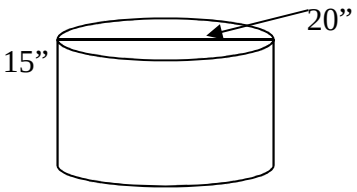
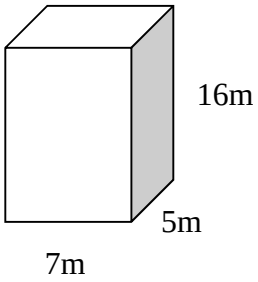
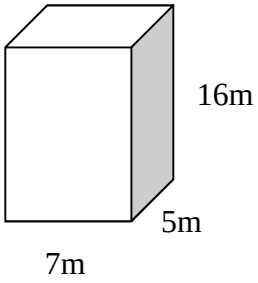
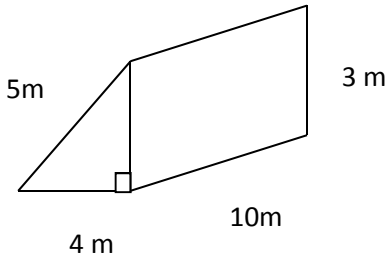
<u>FINDING THE VOLUME AND SURFACE AREA OF COMPOSITE SHAPES</u>:

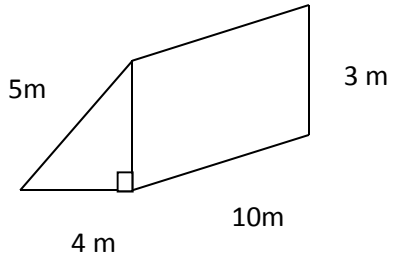
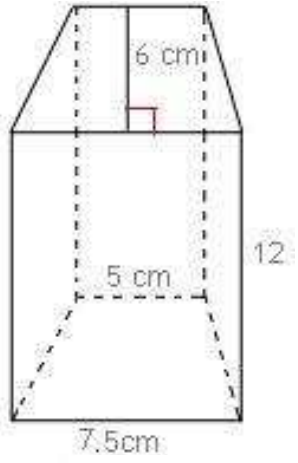
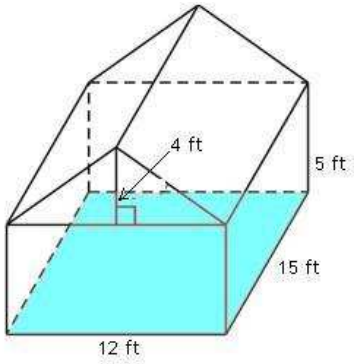
Rules
Step 1: Determine what the question is looking for (Surface Area or Volume)
Step 2: Determine all the shapes that make up the composite shape
Step 3: Decide what formulas you will need to solve the problem for the shapes you have
Step 4: Plug in to the formula(s)
Step 5: Solve them and combine the answers.

EXAMPLES:

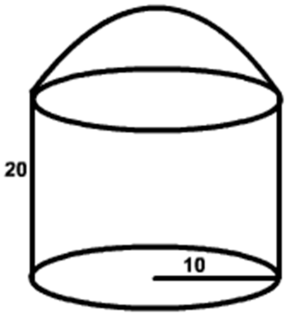
Find the Surface Area or Volume for each:

1. 	SA =

2.  	V =
3.  	SA =
4.  	V =
5.  	SA =

6.  	V =
7.  	V =
8.  	There is a shed in Mr. Torquato's backyard that matches the figure to the left. Find the surface area of the outside walls/roof of Mr. Torquato's shed. Draw the shapes that make up his shed:
Find the surface area:	

6. The following figure is a container that holds water. How much water can fit into the container?



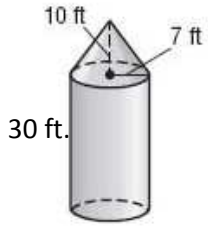
7. Mary is wrapping a cylindrical can of paint as a gag gift for a friend. If the can is 11 inches high and has a diameter of 7 inches, how many square inches of wrapping paper will she use in completely covering the can?

TRY THESE:

Determine if the given example is surface area or volume.

1) Wrapping a present
2) Painting a model home
3) Filling a jar with candy
4) Filling a cylinder pot with soil

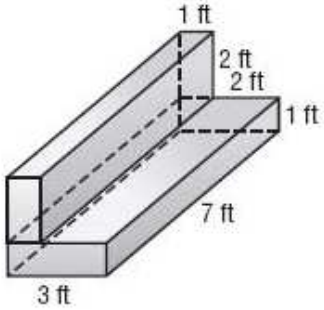
5) **FARMING** The dimensions of a silo are shown below. Find the volume of the silo.



6) A quarter is really a very short cylinder. Its height is about 1mm and its diameter is about 24mm. Find the surface area of a quarter.

$$SA = 2\pi rh + 2\pi r^2$$

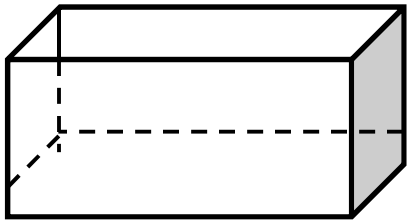
7) **FOAM** The figure below shows a piece of foam packaging. Find the surface area of the foam.



Draw all the rectangles that make up its surface area.:

Lesson 6: Classwork/Homework **Show ALL work!!**

1. A BOX IS IN THE SHAPE OF A RECTANGULAR PRISM AS SHOWN BELOW. THE TOP OF THE BOX HAS BEEN REMOVED. EXPLAIN HOW THE SURFACE AREA OF THIS BOX DIFFERS FROM THAT OF A RECTANGULAR PRISM



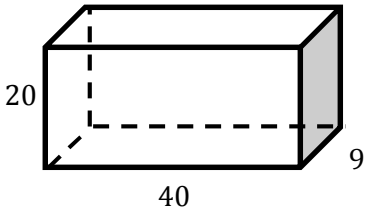
_____

_____

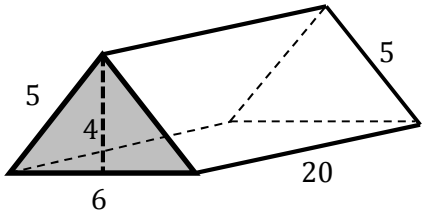
_____

_____

2. Find the surface area of the rectangular prism

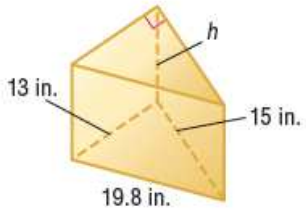


3. Find the surface area of the triangular prism



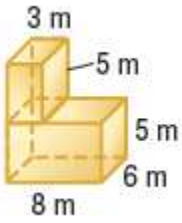
4.

A triangular prism has a volume of 1,560 cubic inches and a base of 13 inches by 15 inches. What is the height of the prism?



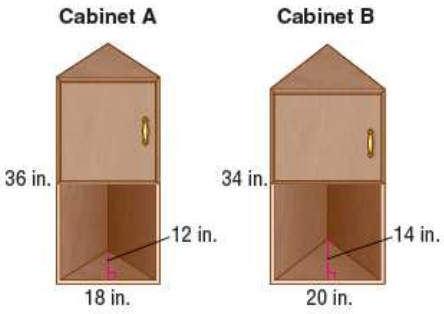
A. 8 in.
C. 16 in.
B. 12 in.
D. 24 in.

5. Find the surface area of the following figure.

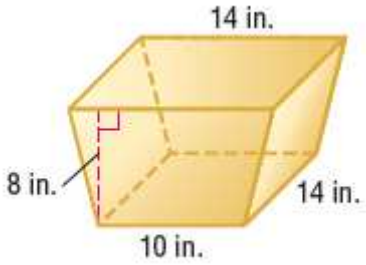


6.

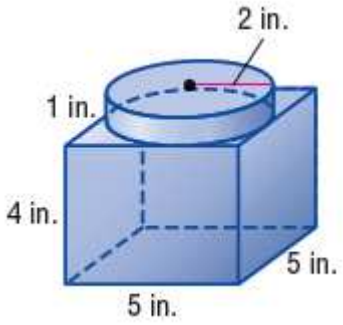
. **SHORT RESPONSE** Tia wants to purchase the corner kitchen cabinet with the greater volume. Find the volume of each cabinet to determine which one Tia should buy.



7. Determine the Volume of the following shape



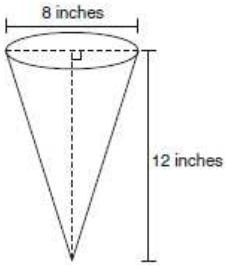
8. Find the volume of the following figure



9. The lateral faces of a regular pyramid are composed of

1) Squares
2) Rectangles
3) Congruent right Triangles
4) Congruent Isosceles Triangles

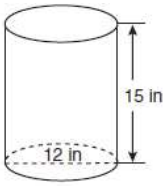
10. In the diagram below, a right circular cone has a diameter of 8 inches and a height of 12 inches.



What is the volume of the cone to the *nearest cubic inch*?

1) 201
2) 481
3) 603
4) 804

11. A cylindrical container has a diameter of 12 inches and a height of 15 inches, as illustrated in the diagram below.



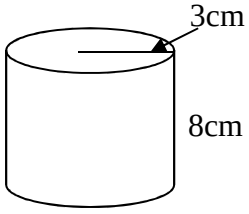
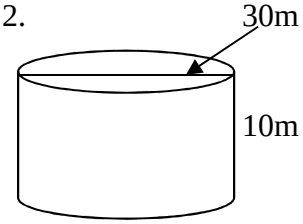
(Not drawn to scale)

What is the volume of this container to the *nearest tenth* of a cubic inch?

1) 6,785.8
2) 4,241.2
3) 2,160.0
4) 1,696.5

12. How many square inches of wrapping paper are needed to entirely cover a box that is 2 inches by 3 inches by 4 inches? 1) 18 2) 24 3) 26 4) 52	13. Lenny made a cube in technology class. Each edge measured 1.5 cm. What is the volume of the cube in cubic centimeters? 1) 2.25 2) 3.375 3) 9.0 4) 13.5

Extra Help:

1.  Find the Surface Area: Find the Volume:	2.  Find the Surface Area: Find the Volume:

3) The volume of a cube is $27cm^3$. What is the length of each side?

4) The length and width of the base of a rectangular prism are 5.5 cm and 3 cm. The height of the prism is 6.75 cm. Find the *exact* value of the surface area of the prism, in square centimeters.

Lesson 7

Use a Protractor to Draw and Measure Angles

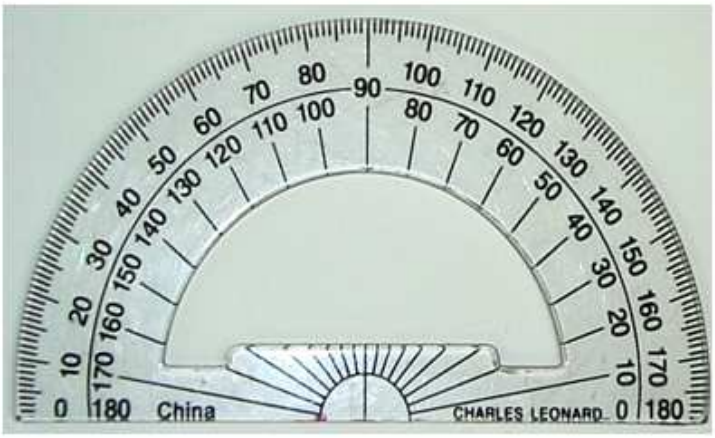
Vocabulary:

A **Protractor** is used to measure the degrees of an angle or draw an angle.

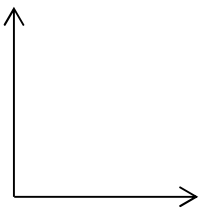
Name of Angle	Definition	Picture
Right Angle	An angle that measures 90°	
Acute Angle	An angle that measures between 0° and 90°	
Obtuse Angle	An angle that measures between 90° and 180°	
Straight Angle	An angle that measures 180°	

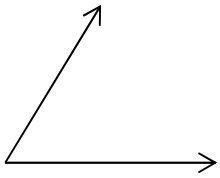
Using a Protractor:

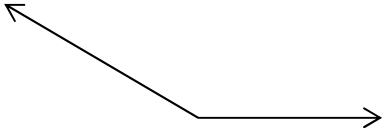
Always be careful which numbers to use on the Protractor depending on which way the angle is opening up.

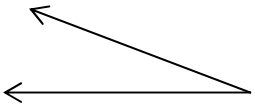


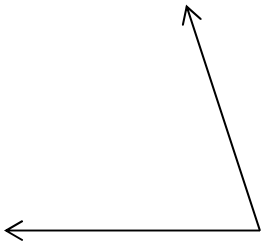
Examples: Tell the measure and type of each angle below

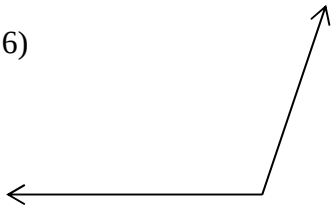
1) 

2) 

3) 

4) 

5) 

6) 

Draw a line:

7) 10 cm

8) 3 in.

9) 50 mm

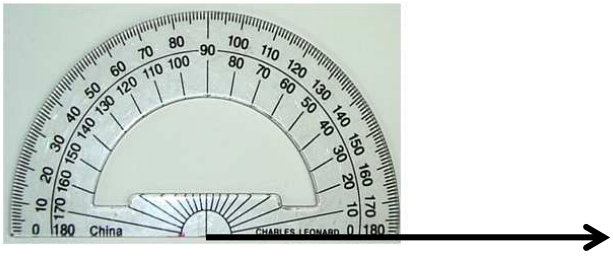
10) $4\frac{1}{2}$ in.

11) Which is longer? A 2 in. line or a 5 cm lime? Prove by drawing each line.

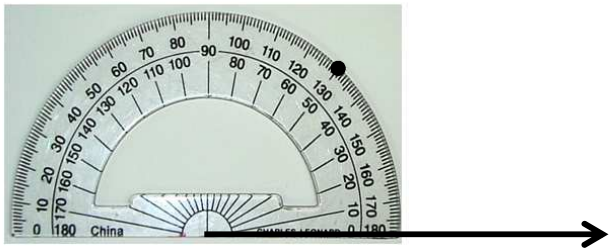
Constructing a 50º angle **Follow Steps**

Step1: Draw a horizontal line using a ruler or protractor

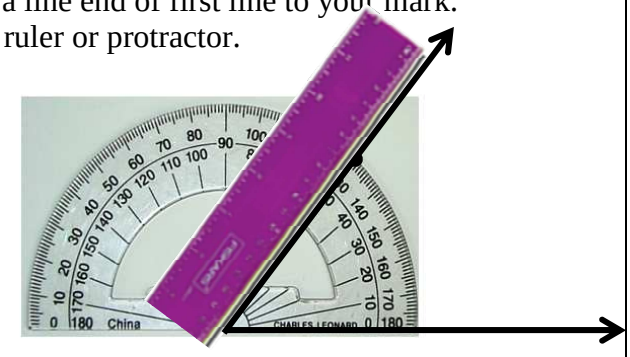
Step 2: Place center of Protractor at one end of line



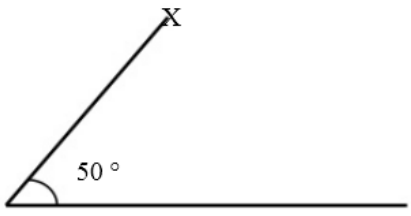
Step 3 : Mark 50 ° at edge of protractor.



Step 4 : Draw a line end of first line to your mark.
Use a ruler or protractor.



Step 5 : Label angle that you have created.



Try These:

1) Create a 45 ° angle with the vertex on the left

2) Create a 90 ° angle with the vertex on the right

3) Create a 75 ° angle with the vertex on the left

4) Create a 30 ° angle with the vertex on the right

5) Create a 53 ° angle with the vertex on the left

6) Create a 120 ° angle with the vertex on the right

7) Create a 133° angle with the vertex on the left

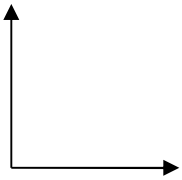
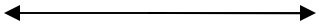
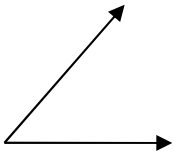
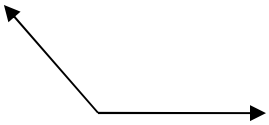
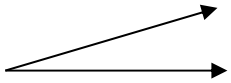
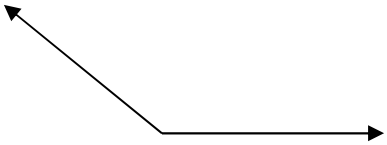
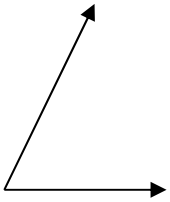
8) Create a 17 ° angle with the vertex on the right

9) Create a 101 ° angle with the vertex on the left

10) Create a 5 ° angle with the vertex on the right

Lesson 7: Classwork/Homework

Tell what type of angle each is and then its degrees.

1) _____ angle  _____ degrees	2) _____angle  _____ degrees
3) _____ angle  _____ degrees	4) _____ angle  _____ degrees
5) _____ angle  _____ degrees	6) _____ angle  _____ degrees
7) _____angle  _____ degrees	8) _____angle  _____ degrees

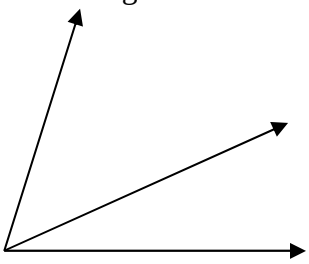
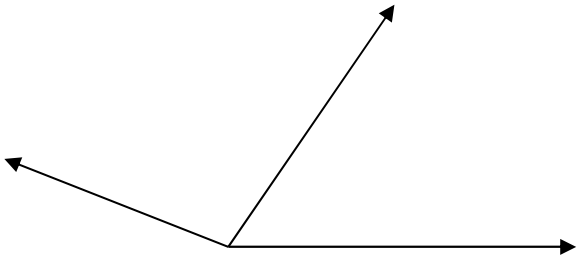
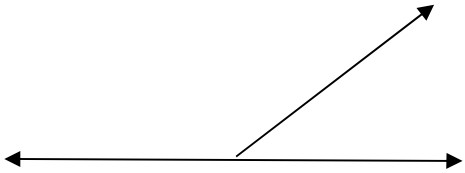
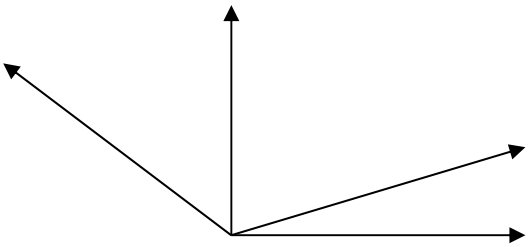
Draw a line:

9) 5 inches

10) 5 cm

11) 5 mm

Given each pair of adjacent angles, carefully measure and label each angle separately.

12) Measure both angles and label. 	13) Measure both angles and label. 
14) Measure both angles and label. 	15) Measure all three angles and label. 

Draw the angles using a protractor

16) 90 degrees	17) 180 degrees
18) 45 degrees	19) 270 degrees
20) 25 degrees	21) 75 degrees

Lesson 8
Draw Quadrilaterals and Triangles Given their Sides and Angles

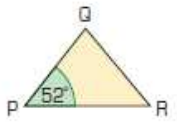
Rules for Constructing Polygons
1 – Label all sides and angles
2 – First sketch the shape labeling the each vertex
3 – Use a Ruler and Protractor for your final shape

Construct – To draw accurately

example

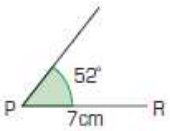
Draw triangle PQR where PQ = 5.5 cm, PR = 7 cm and P = 52°

First sketch the triangle.

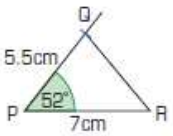


Make the longest side the base – label it.

Draw angle P at point P.



Mark Q 5.5 cm from P.



Draw in the last side by joining PR.

Examples:

1) Draw Triangle PQR where PQ = 5.5 cm, PR = 7 cm and P = 52º

2) Construct triangle ABC where AB = 6cm, B = 50º and A = 46º

You can check your drawing for accuracy by measuring angle C. If B = 50º and A = 46º
What should angle C measure?

3) Construct Square ABCD where side AB = 1.5 in.

3) Construct Rectangle ABCD where side AB = 2 cm and BC = 4 cm

4) Construct Parallelogram ABCD where side AB = 30 mm, BC = 50 mm, < A = 120° and < B = 60°

5) Construct Trapezoid ABCD where sides AB = 2 in,, BC = 5 in., CD = 2 in., AD = 3.5 in. and
< A = 110° , < B = 70° < C = 70° and < D = 110°

Try These:

1) Construct a Triangle PQR with where side PQ = 5 cm, side QR = 10 cm and < Q = 45 °.

2) Create (means the same rules as construct) a triangle with one side 7 cm, one side 8 cm and an angle of 30 °. (Be sure to label sides and angles)

3) Draw (means the same rules as construct) quadrilateral ABCD where side AB = 4 in., BC = 4 in., CD = 4 in., AD = 4 in. and < A = 100°, < B = 80°, < C = 100°, < D = 80°,

Lesson 8: Classwork/Homework

Use a protractor and ruler to construct each of the following

1) ΔABC with $AB = 8$ cm, $\angle ABC = 40°$ and $\angle BAC = 54°$.

2) ΔPQR with $PQ = 6$ cm, $\angle PQR = 48°$ and $\angle QPR = 47°$.

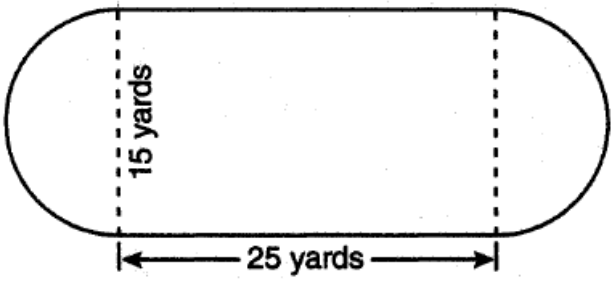
3) ΔABC with $AB = 6$ cm, $\angle BAC = 85°$ and $BC = 7$ cm.

4) ΔABC with $AB = 7$ cm, $AC = 5$ cm and $\angle BAC = 55°$.

5) ΔPQR with $PQ = 7.5$ cm, $PR = 6.8$ cm and $\angle QPR = 75°$.

Review Work:

6) A playground in a local community consists of a rectangle and two semicircles, as shown in the diagram below. What is the area?



Lesson 9

Draw Triangles and Determine Uniqueness

Vocabulary:

Triangle Inequality Theorem – The sum of the lengths of any two sides of a triangle is greater than the length of the third side. Use this theorem to check if the given sides will create a triangle.

Unique – Only 1 triangle can be created with the given side(s) and angle(s).

There are three different options when creating triangles given information on their side(s)/angle(s):

- No triangle can be created (**Triangle Inequality Theorem**)
- Only 1 triangle can be created (**Unique**)
- More than one triangle can be created (**Not unique**)

Triangle Inequality Theorem Steps:

1) **Add a pair of sides.**
2) **Check to see if the sum is greater than the third side.**
3) **Repeat with the other two pairs.**

Examples:

Use the triangle inequality theorem to determine if it is possible to construct a triangle with the given side lengths.

1) 6 in., 10 in. and 20 in.

2) 6 m, 8m and 10m

3) 7mi., 15mi. and 6mi.

4) 4m, 8m and 3m

5) 5 ft., 7 ft. and 1 ft.

6) 8in., 8in. and 2in.

Uniqueness (One Triangle):

There are four ways to ensure that when you are given measurements to draw a triangle that you can create only ONE triangle and therefore it is unique.

Given Measurements *(Must be consecutive in this order)*	**Example**	**Picture** (There is only one triangle that can be created)
Angle, Side, Angle	Triangle ABC, <A = 40 degrees, Side AB = 1in, <B = 60 degrees	
Angle, Angle, Side **OR** **Side, Angle, Angle**	Triangle ABC, <A = 40 degrees, <B = 60 degrees, Side BC = 1 in	
Side, Angle, Side	Triangle ABC, Side AB = 1in <A = 40 degrees Side AC = 2in	

Side, Side, Side	Triangle ABC, Side AB = 1 in Side BC = 2 in Side AC = 3 in	

****Challenge:** 4) Which three combinations will not work? _____

Unique Triangles: **SSS, SAS, ASA, AAS, SAA**	**More than one triangle:** **AAA, ASS, SSA**	**No Triangle:** **Triangle Inequality Theorem**

Determine if the given measurements will create only one triangle or more than one triangle:

5) Given Triangle DEF
<D = 30 degrees,
Side DE = 5cm
<E = 45 degrees,

6) Given Triangle DEF
<D = 60 degrees
<E = 50 degrees
<F = 70 degrees

7) Given Triangle DEF
Side DE = 8 cm
Side EF = 6 cm
Side DF = 4 cm

8) Given Triangle DEF
<D = 30 degrees,
Side DE = 2 in
Side EF = 4in

*9) Given Triangle DEF
Side DE = 7cm
Side EF = 4cm
<E = 75 degrees

*10) Side DF = 4 cm
Side DE = 10 cm
Side EF = 5 cm

Try These:

Can the following three measurements form a triangle?

1) 3m, 6m and 2m

2) 11 ft, 12 ft and 9 ft

3) 1in, 13in and 13in

Determine if the given measurements will create only one triangle or more than one triangle:

4) Given Triangle ABC
Side AB = 2in,
Side BC = 3 in
<A = 67 degrees

5) Given Triangle ABC
Side AB = 8cm
<B = 44 degrees
Side BC = 5cm

6) Given Triangle ABC
Side AB = 12 cm
Side BC = 10 cm
Side AC = 1 cm

Lesson 9: Classwork/Homework

Can the following three measurements form a triangle?

1) 5m, 8m and 4m

2) 9 ft, 15 ft and 3ft

3) 6in, 12in and 5in

Determine if the given measurements will create only one triangle or more than one triangle:

4) Given Triangle XYZ
< X =55 degrees,
Side XY = 5cm
Side XZ = 3cm,

5) Given Triangle XYZ
< X = 35 degrees
< Y = 65 degrees
< Z = 80 degrees

6) Given Triangle XYZ
Side XY = 6 cm
Side YZ = 3 cm
Side XZ = 7 cm

Review Work:
Write the equation of a line when:

7) b = 2, m = -5

8) slope = 1/2, y-intercept = 3

9) m = 4, b = 0

10) y-intercept = 3, slope = 2

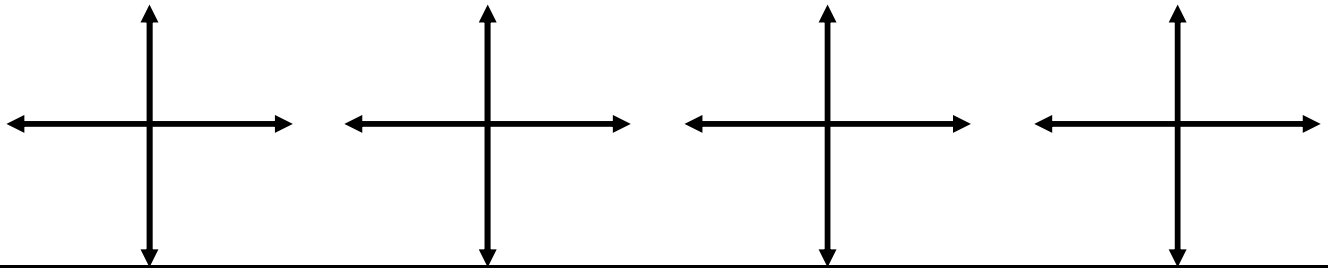
Draw any line with the following slopes:

11) Positive Slope

12) Negative Slope

14) Zero Slope

15) Undefined Slope (no slope)



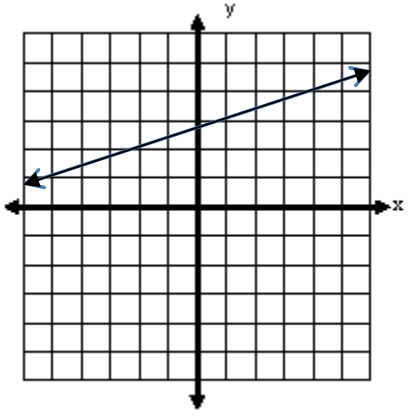
Solve for y and write the equation in y = mx + b form:

16) 2x + y = 6

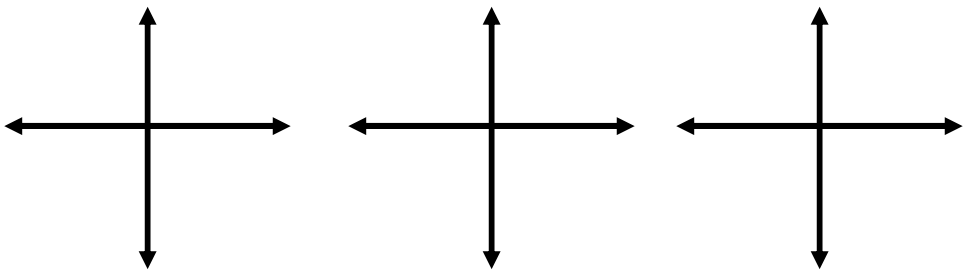
17) -x + y = -8

18) 4y = 8x + 16

19) What is the slope of the line

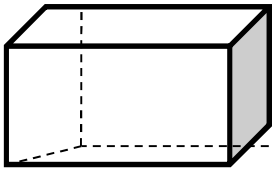


20) Draw 2 lines representing the following number of solutions:
a) No Solutions b) One Solution c) Infinite Solutions



Name_____ **8R** **Unit 10 Review**

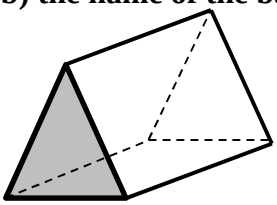
For each of the following: a) name the figure b) the name of the base shape c) the number of faces

1. 

a)_____

b)_____

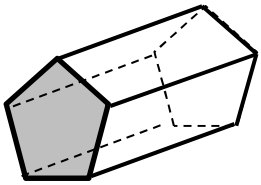
c)_____

2. 

a)_____

b)_____

c)_____

3. 

a)_____

b)_____

c)_____

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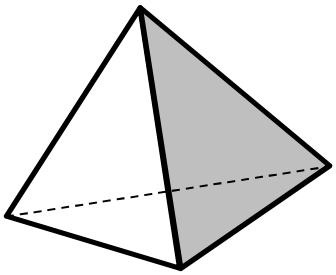
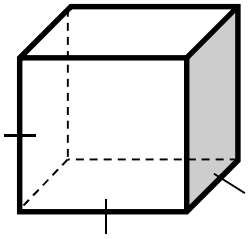
4. 

a)_____

b)_____

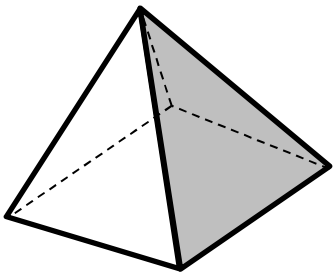
c)_____

5. 

a)_____

b)_____

c)_____

6. 

a)_____

b)_____

c)_____

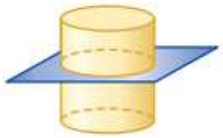
Identify the cross sections in each of the figures:

7. 

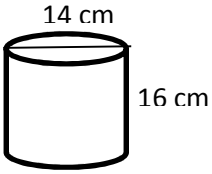
8. 

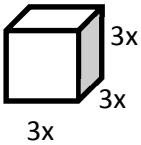
9. 

10. 

11. 

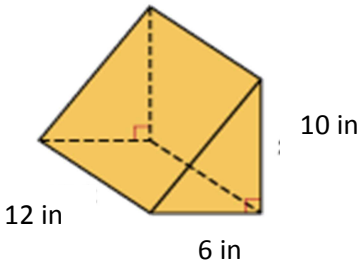
Find the Surface Area for the following:

12. 

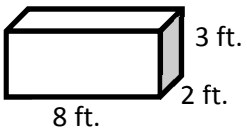
13. 

Find the surface area of the following:

14.



15.



State whether you find the surface area or volume of the situation:

16. Wrapping a gift: _____

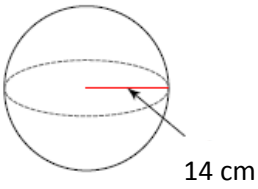
17. Filling up a pool:_____

18. Amount of soda in a can:_____

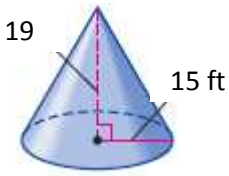
19. Amount of wall space to paint:_____

Find the volume of the following 3-D figures:

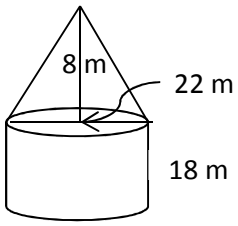
20.



21.

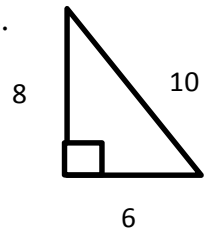


22. Find the volume of the cylinder with a cone on top of it:

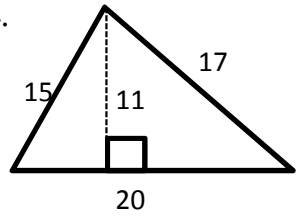


Find the area of the following figures:

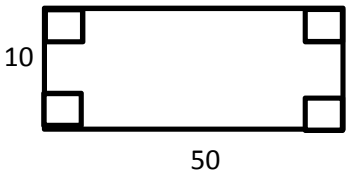
23.



24.

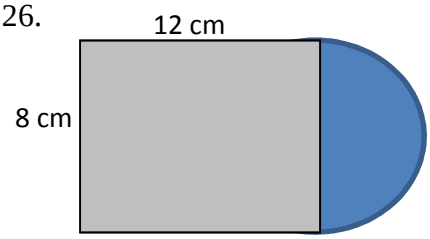


25.

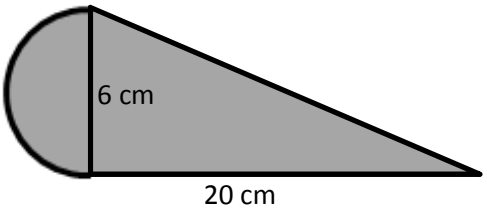


Find the area of the following composite figures:

26.



27.



28. Which of the following will form a triangle:

a) 100°, 40°, 50° b) 83°, 50°, 47° c) 25°, 90°, 90° d) 38°, 45°, 77°

29. Which measures will form a triangle:

a) 9cm, 10 cm, 2 cm b) 2m, 2m, 6m c) 15 in, 20in, 25in d) 5m, 6m, 7m

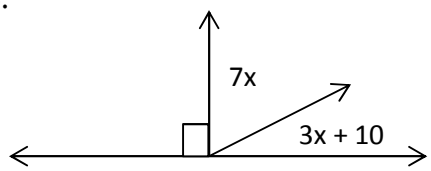
30. A triangle has the following sides: (3x + 5), (9x – 4) and (10x – 12), what is the perimeter of the triangle?

31. The volume of a rectangular prism is 250 inches cubed. If the length is 10 inches and the width is 12.5 inches then what will the height be?

32. A cylinder has a radius of 12 and a Volume of 1152π. What is the height?

Unit 9 Review:

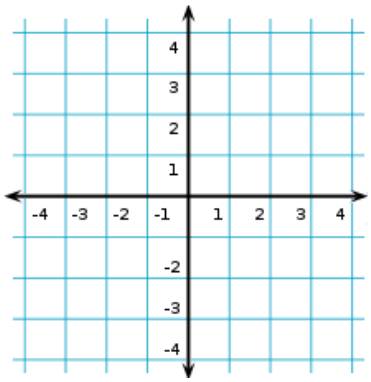
33. Part A: Solve for x Part B: Find 3x + 10



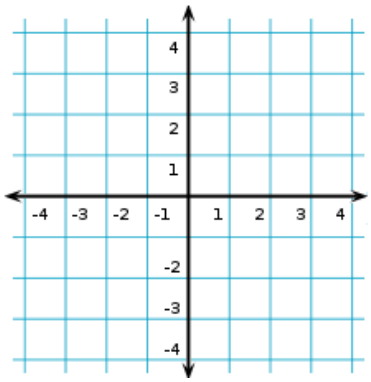
Unit 8 Review:

34. Graph the transformation, label each transformation with the letters **A – C and A'-C'** and list the coordinate.

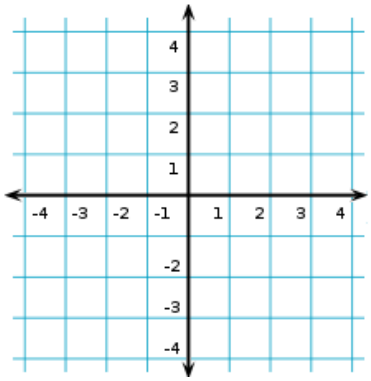
A. Reflect A(3,1) in the *y*-axis



B. Rotate B(-2,-3) 90 degrees clockwise



C. Translate C(-1,-2) 3 spots to the right.



Unit 7 Review:

State the number of solutions each of the pair of equations have (No solutions, One solution or Infinite solutions):

35. $y = 5x + 1$
$y = 5x + 2$

36. $-5x + 3y = 14$
$5x + 3y = 10$

37. $y = 3x - 2$
$2y = 6x - 4$

Unit 6 Review:

38. What is the slope and y intercept of the following lines:

A) $3y = 9x - 6$ B) $y = \frac{1}{2}x + 2$ C) $y = 3x$

39. Write the equation of the line:

x	y
5	12
6	16
7	20
8	24

40. Determine if the following would be considered a function or NOT a function.

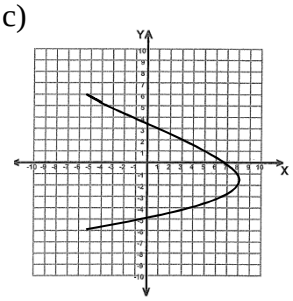
a)

X	y
2	2
4	3
8	4
12	4
15	6

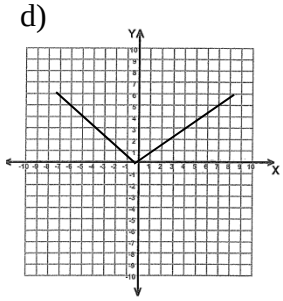
b)

x	y
3	4
8	3
5	2
7	0

c)



d)

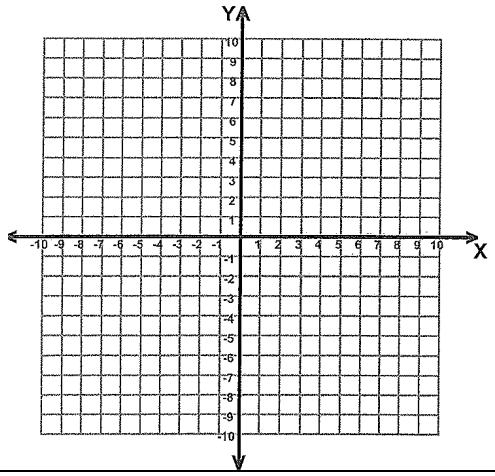


e) {(1, 2), (5, 7), (3, 4), (5, 2)}

f) {(1, 3), (5, 3), (7, 4), (8,2)}

Unit 5 Review:

41. a) Graph the system of equations:
y = 3x + 1
y = -x + 5



b) What is the solution?_____

Unit 4 Review:

Solve for x:

42. 5(4x – 2) = 2(15x – 10)

43. 9x + 10 = 12x – 14

Unit 3 Review: Simplify. Rewrite using all positive exponents.

44. $4x^0$

45. 4^0

46. $\frac{4}{0}$

47. $9^{-3}x9^9$

48. $3^{-2}x3^2$

Unit 1 and 2 Review:

49. Translate the following: A cab ride costs you $5.00 initially plus $4.00 per mile.

Unit 11

Scientific Notation

	Date	Lesson	Topic
		1	Introduction to Scientific Notation
		2	Converting Scientific Notation
		3	Compare and Order Scientific Notation
		4	Add and Subtract Without a Calculator
		5	Multiply and Divide Without Calculator
			Review for Quiz
			Quiz
		6	Application Problems
		7	Add, Subtract, Multiply, and Divide With a Calculator
			Review
			Test

Lesson 1
Introduction to Scientific Notation
Making Sure a Number is Written in Scientific Notation

Vocabulary:

Scientific Notation - When you are dealing with very **large** or very **small** numbers, it is helpful to be able to write them in a shorter form.

Scientific Notation		**Standard Form**
2.59×10^{11}	=	259,000,000,000

Coefficient *Power of 10*

Rule: A number is in **scientific notation** if:

1) The first factor is a single digit followed by a decimal point
2) Times the second factor which is a power of 10.

Examples: Determine if the numbers below are written in scientific notation.

1) 3.2×10^{4} 2) 78.96×10^{4} 3) 456.1×10^{-8} 4) $9. \times 10^{-5}$

Scientific Notation: Positive Exponents and Negative Exponents

A number in scientific notation with a **positive exponent** represents a number **larger than 1** (whole number).

A number in scientific notation with a **negative exponent** represents a number **between 0 and 1** (decimal).

Remember:

Positive Exponent ⇨ _____

Negative Exponent ⇨ _____

Scientific Notation: Real Life Situations

When is it appropriate to use scientific notation in real life? _____

Examples of Large Numbers:	**Examples of Small Numbers:**
_____	_____
_____	_____
_____	_____

Determine if the number in scientific notation would be written with a positive or negative exponent.

5) The weight of 10 Mack trucks (in pounds)

6) The width of a grain of sand (in feet)

Determine if the numbers below will be whole numbers or decimals.

7) 1.3×10^{5}

8) 5.8×10^{-5}

9) 6.9×10^{-9}

10) 5×10^{9}

Scientific Notation: Making Sure a Number is Written in Scientific Notation

Rule:

If Decimal Point needs to move to the LEFT – Exponent Increases (48.6×10^{3})

If Decimal Point needs to move to the RIGHT – Exponent Decreases ($.48 \times 10^{3}$)

* Be careful when exponent is negative.

Write each in Scientific Notation if necessary:

11) 68.7×10^{9} = _____

12) 6×10^{5} = _____

13) 0.725×10^{8} = _____

14) 0.292×10^{-4} = _____

15) 326×10^{-8} = _____

16) 7.5×10^{-9} = _____

Try These:

Determine if the numbers below are written in scientific notation.

1) 4.1×10^{15}

2) 24.01×10^{5}

Determine if the numbers below are in whole numbers or decimals.

3) 2.1×10^{15}

4) 2.1×10^{-15}

Determine if the number in scientific notation would be written with a positive or negative exponent.

5) The size of a cheek cell (in feet)

6) The mass of earth (in pounds)

Write each in **Scientific Notation if necessary:**

7) 29×10^{6} = _____

8) $.32 \times 10^{-7}$ = _____

9) 5.5×10^{-4} = _____

10) 386.4×10^{-6} = _____

Lesson 1: Classwork

Determine if the numbers below are written in scientific notation.

1) 2.5×10^{5}

2) 1.908×10^{17}

3) $4.0701 + 10^{7}$

4) 0.325×10^{-2}

5) 7.99×10^{32}

6) 6.5×10^{4}

7) 34.5×10^{-7}

8) 3×10^{8}

9) 658×10^{-9}

Determine if the following number in scientific notation would be written as a positive or negative exponent.

10) How many drops of water in a river

11) The weight of a skin cell (in pounds)

12) The width of an eyelash (in feet)

13) The weight of the Brooklyn bridge (in pounds)

Write an example of something that would be written in scientific notation with a:

14) Positive exponent _____

15) Negative exponent _____

Write each in Scientific Notation if necessary:

16) $123 \times 10^{5} =$ _____

17) $0.6 \times 10^{-5} =$ _____

18) $2.8 \times 10^{4} =$ _____

19) $0.35 \times 10^{3} =$ _____

20) $23.1 \times 10^{-8} =$ _____

21) $4.65 \times 10^{-2} =$ _____

Lesson 1: Homework

Determine if the numbers below are written in scientific notation.

1) 1.5×10^4 2) 1.50×10^5 3) 0.42×10^2 4) $4.56 + 10^6$ 5) 134, 987

6) 9.5×10^{-3} 7) 17×10^{-16} 8) 75.9×10^6 9) 1.3×10^{-23} 10) 65×10^2

Determine if the following number in scientific notation would be written as a positive or negative exponent.

11) How many seconds in a year

12) The width of a piece of thread (in feet)

13) The weight of a skyscraper (in pounds)

14) The weight of an electron (in pounds)

Write each in Scientific Notation if necessary:

15) $0.25 \times 10^4 =$ _____

16) $26.08 \times 10^9 =$ _____

17) $16 \times 10^{-3} =$ _____

18) $0.27 \times 10^{-8} =$ _____

19) $6 \times 10^{-5} =$ _____

20) $925.4 \times 10^{18} =$ _____

Review Work:

21) $7^3 \times 7^{-6}$

22) $\left(\frac{1}{4}\right)^{-3}$

23) $4x + x - 8 = 5x + 12$

24) $\frac{18}{-3}$

Lesson 2
Converting Standard Form to Scientific Notation
Converting Scientific Notation to Standard Form

Standard Form → Scientific Notation

Rule:

Step 1: Write the number placing the decimal point after the first non-zero digit

Step 2: Write x 10

Step 3: Count the number of digits you moved the decimal point and write it as the exponent

Remember:

If it is a whole number ⟹ the exponent is _____.

If it is a decimal ⟹ the exponent is _____.

Examples:
Convert from standard form to scientific notation.

1) 245,000,000 = _____

2) .00084 = _____

3) 500,000 = _____

4) .000007643 = _____

Scientific Notation → Standard Form

Rule:

Step 1: Move decimal point the number of places indicated by the exponent.

Step 2: If - **Positive** exponent: Move decimal point **Right**
If - **Negative** exponent: Move decimal point **Left**

Convert from scientific notation to standard form.

5) 5.93×10^{3} = _____

6) 1.9×10^{-7} = _____

7) 4.765×10^{8} = _____

8) 8.32×10^{-4} = _____

A positive, finite decimal s is said to be written in scientific notation if it is expressed as a product $d \times 10^n$, where d is a finite decimal so that $1 \leq d < 10$, and n is an integer.

The integer n is called the order of **magnitude** of the decimal $d \times 10^n$.

Try These:

Write each of the following in **scientific notation**:

1) 650,000 _____ 2) 23,500,000_____

3) 0.00034 _____ 4) 0.00758 _____

Write each of the following in **standard form**:

5) 4.6×10^4 _____ 6) 1.98×10^6 _____

7) 6.23×10^{-7}_____ 8) 5.55×10^{-3} _____

Review: Write each in Scientific Notation if necessary

9) 20×10^4 = _____ 10) 0.33×10^{-6} = _____

11) 25.9×10^{-9} = _____ 12) 0.45×10^2 = _____

---

13) What is the value of n in the problem: $91{,}000 = 9.1 \times 10^n$ n = _____

14) What is the value of n in the problem: $0.0000027 = 2.7 \times 10^n$ n = _____

Lesson 2: Classwork

Write each of the following in **scientific notation**:

1) 523,000,000 _____ 2) 7,740 _____

3) 0.00624 _____ 4) 0.0000002_____

Write each of the following in **standard form**:

5) 6.0×10^6 _____ 6) 2.13×10^2 _____

7) 4.7×10^{-4}_____ 8) 7.24×10^{-5} _____

Review: Write each in Scientific Notation if necessary

9) 578×10^6 = _____ 10) 0.7×10^{-3} = _____

11) 55.8×10^{-5} = _____ 12) 0.11×10^5 = _____

---

13) What is the value of n in the problem: $624{,}000 = 6.24 \times 10^n$ n = _____

---

14) If n = 7, find the value of 5.2×10^n in standard form. _____

---

15) Which number is written in the correct scientific notation form?

A) 5,000 B) 0.5×10^2 C) 5.0×10^{-4} D) 50×10^5

Lesson 2: Homework

Write each of the following in **scientific notation**:

1) 5,000,000 _____ 2) 6,267 _____

3) 0.046 _____ 4) 0.000004_____

Write each of the following in **standard form**:

5) 2.0×10^3 _____ 6) 5.14×10^6 _____

7) 9.8×10^{-2}_____ 8) 3.75×10^{-9} _____

Review: Write each in Scientific Notation if necessary

9) $.98 \times 10^3$ = _____

10) 79.02×10^8 = _____

11) 25×10^{-4} = _____

12) 0.18×10^{-6} = _____

13) 7×10^{-4} = _____

14) 925.4×10^{26} = _____

---

15) What is the value of n in the problem: $624{,}000 = 6.24 \times 10^n$ n = _____

16) If n = 4, find the value of 2.3×10^n in standard form. _____

---

17) Which number is written in the correct scientific notation form?

A) 0.034×10^4 B) 3000 C) 3.4×10^4 D) 68×10^4

---

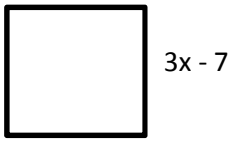
18) Which number is 21.6×10^{-5} written in correct scientific notation

A) 2.16×10^{-6} B) 2.16×10^{-4} C) 2.16×10^6 D) 2.16×10^4

Review Work:

19) Translate: 4 more than twice a number

20) Find the perimeter of the square below.



Solve for x:

21) $7x + 12 = 2(x + 6)$

Simplify:

22) $5^{10} \times 5^{-7}$

16) $\frac{2^{-5}}{2^{-8}}$

Lesson 3
Comparing Order of Numbers in Scientific Notation

Comparing Rule:

1) Put all values into correct scientific notation. Look at exponents first…

2) If the **exponents** are **different**, the larger exponent is the bigger number

3) I f the **exponents** are the **same**, compare the coefficients of each.

Examples:

Which is larger? Explain in words how you knew.

1) 1.4×10^3 or 5.8×10^3

2) 2.5×10^{-2} or 2.5×10^4

3) 8.2×10^5 or 200,000

4) 2.5×10^6 or 2,500,000

5) 53×10^2 or 5.32×10^3

6) $.24 \times 10^{-2}$ or 230×10^{-5}

Compare: Use < , >, or =

7) 8.3×10^6 ◯ 8×10^{48}

8) 2.4×10^5 ◯ 2.1×10^7

9) 4.6×10^7 ◯ 460×10^5

10) 2.7×10^6 ◯ 2 million

---

11) Put in order from least to greatest:

4.2×10^7 0.56×10^3 6.3×10^5 4.25×10^7

Try These:

Compare: Use < , >, or =

1) 34,000 ◯ 3.4×10^4

2) 5.4×10^{-2} ◯ 0.0054

3) 7.5×10^9 ◯ 3.4×10^{-11}

4) 5.68×10^{-3} ◯ 2.3×10^2

5) Put in order least to greatest: 2.8×10^6 5.7×10^3 6.1×10^5 $.0285 \times 10^8$

6) The Fornax Dwarf galaxy is 4.6×10^5 light-years away from Earth, while Andromeda I is 2.430×10^6 light-years away from Earth. Which is closer to Earth?

7) The average lifetime of the tau lepton is 2.906×10^{-13} seconds and the average lifetime of the neutral pion is 8.4×10^{-17} seconds. Explain which subatomic particle has a longer average lifetime.

Lesson 3: Classwork

Which is larger?

1) 8.1×10^{-2} or 2.9×10^{-4}

2) 2.4×10^3 or 2,400

3) 2.7×10^8 or 2.07×10^8

4) 9.9×10^{-3} or 0.0009

Compare: Use < , >, or =

5) 4.5×10^{5} ◯ 5×10^{5}

6) 2.6×10^{-6} ◯ 2.6×10^{-3}

7) 7.4×10^{5} ◯ 7.4×10^{7}

8) 5.1×10^{9} ◯ 5.01×10^{9}

9) 4.2×10^{-4} ◯ 5.6×10^{7}

10) 9.1×10^{-7} ◯ 2.30×10^{-5}

11) 5.2×10^{-3} ◯ 63×10^{-3}

12) 8.1×10^{2} ◯ 35×10

Put in order from least to greatest:

13) 1.5×10^{2} 8.7×10^{4} 7.3×10^{5} 1,500

---

14) 3.6×10^{-2} 4.5×10^{3} 6.7×10^{-2} 0.91×10^{3}

Lesson 3: Homework

Which is larger?

1) 4.2×10^8 or 4.2×10^9

2) 9.2×10^6 or 9 million

3) $-.058 \times 10^5$ or -5.8×10^5

4) 7.5×10^{-4} or .000075

Compare: Use < , >, or =

5) 9.3×10^{28} ◯ 9.2879×10^{28}.

6) 3.4×10^3 ◯ 3.48×10^3

7) 2.1×10^5 ◯ 1.1×10^7

8) 4.8×10^3 ◯ -2.8×10^3

9) 5.5×10^4 ◯ 7.6×10^{-8}

10) 0.012×10^0 ◯ 6.9×10^{-5}

11) 1.9×10^{-10} ◯ 5.3×10^{-9}

12) 70×10^{-6} ◯ $.34 \times 10^{-4}$

13) Put in order least to greatest: 2.7×10^{10} 207×10^8 2×10^{10}

Review Work:

14) If **x = 2** and **y = -3**, evaluate: $5x - 2y$

15) Solve for x:

$0.1(5x + 20) - 5 = 0.25(2x + 8)$

Write each of the following in scientific notation:

16) 25,000 _____ 17) 302,000,000_____

18) -4,700_____ 19) 2 million_____

Write each of the following in standard form:

20) 2.4×10^{7} _____ 21) 8×10^{3} _____

22) 8.1×10^{-4} _____ 23) 4.03×10^{-5} _____

What is the value of the missing exponent (n):

24) What is the value of n in the problem: $50{,}200{,}000 = 5.02 \times 10^{n}$ n = _____

25) What is the value of n in the problem: $0.00032 = 3.2 \times 10^{n}$ n = _____

Write each in Scientific Notation if necessary:

26) $.345 \times 10^{7}$ = _____ 27) 22.2×10^{4} = _____

28) 98×10^{-6} = _____ 29) 0.35×10^{-9} = _____

Lesson 4
Adding and Subtracting Numbers in Scientific Notation Without a Calculator

Rule: In order to add and subtract numbers in scientific notation, they must be like terms. The exponent must be the same, just like when adding monomials. For example $2x + 6x = 8x$. Remember $2x^2 + 6x$ cannot be added because they are not like terms.

Rules for Adding and Subtracting Numbers in Scientific Notation when exponents are the <u>same.</u>

1 - Add or Subtract the multipliers.

2 – Keep the power of 10. (Write x 10 to the same power of 10)

3 – Be sure final answer is in correct scientific notation.

Examples:

1) $3.1 \times 10^5 + 9.8 \times 10^5$

2) $7.96 \times 10^9 - 1.8 \times 10^9$

Rules for Adding and Subtracting Numbers in Scientific Notation when exponents are the <u>different.</u>

1 - Convert each number with the same power of 10.
- **It is easier when you convert to smaller exponent to the larger exponent**

2 – Add or Subtract the multipliers.

3 – Keep the power of 10. (Write x 10 to the same power of 10)

4 - Be sure final answer is in correct scientific notation.

3) $3.4 \times 10^4 + 7.1 \times 10^5$

4) $4.87 \times 10^{12} - 7 \times 10^{10}$

OR

Rules for Adding and Subtracting Numbers in Scientific Notation by converting to standard form

1 - Convert each number to standard form.

2 – Add or Subtract.

3 – Convert the answer to scientific notation.

5) $4.87 \times 10^{12} - 7 \times 10^{10}$

6) $3.4 \times 10^{4} + 7.1 \times 10^{5}$

Use any method:

7) $(3.1 \times 10^{8}) + (3.38 \times 10^{7}) - (1.1 \times 10^{8})$

The table below shows the debt of the three most populous states and the three least populous states.

State	**Debt (in dollars)**	**Population (2012)**
California	407,000,000,000	3.8×10^{7}
New York	337,000,000,000	1.9×10^{7}
Texas	276,000,000,000	2.6×10^{7}
North Dakota	4,000,000,000	6.9×10^{4}
Vermont	4,000,000,000	6.26×10^{4}
Wyoming	2,000,000,000	5.76×10^{4}

8) What is the sum of the **debts** for the three most populous states? Express your answer in scientific notation.

9) What is the sum of the **population** for the three least populated states? Express your answer in scientific notation.

10) What is the difference in population between the highest and the least populated states? Express your answer in scientific notation

Try These:

The chart below shows the distance from New York City to other cities around the world.

Trip	**Miles**
NY to Orlando	1.1×10^3
NY to LA	2.4×10^3
NY to Rome	4.3×10^3
NY to Beijing	6.8×10^3
NY to Albany	1×10^2

1) How far is it to go from Orlando to NY to Beijing? Express your answer in scientific notation.

2) How far is it to go from LA to NY to Albany? Express your answer in scientific notation.

3) How much farther is NY to Beijing than NY to LA? Express your answer in scientific notation.

Lesson 4: Homework

1) $(7 \times 10^6) - (5.3 \times 10^6)$

2) $(3.4 \times 10^4) + (7.1 \times 10^4)$

3) $(6.3 \times 10^8) - (8 \times 10^7)$

4) $(5.6 \times 10^{-2}) + (2 \times 10^{-1})$

5) $(4.3 \times 10^{-4}) + (5 \times 10^{-5})$

6) $(3.7 \times 10^3) + (2.1 \times 10^4)$

7) $(8.5 \times 10^4) + (5.3 \times 10^3) - (1 \times 10^2)$

8) $(1.25 \times 10^2) + (5.0 \times 10^1) + (3.25 \times 10^2)$

9) The distance from Neptune to the Sun is approximately 4.5×10^9 km and from Mercury to the Sun is about 5.0×10^7. What is the difference in their distances?

Lesson 5
Multiplying and Dividing Numbers in Scientific Notation Without a Calculator

Rules for Multiplying and Dividing Numbers in Scientific Notation without a Calculator

1 - Multiply or Divide Coefficients – Using rules of multiplying or dividing decimals.

2 - Multiply or Divide powers of 10 by adding or subtracting the exponents.

3 – Make sure the answer is in correct scientific notation.
- If you have to move the decimal to the **Left**, **INCREASE** the exponent.
- If you have to move the decimal to the **Right**, **DECREASE** the exponent.

Examples:

1) $(3.5 \times 10^3)(2 \times 10^5)$

2) $(8.0 \times 10^6) \div (2.5 \times 10^3)$

3) $(7.2 \times 10^5)(6.5 \times 10^4)$

4) $(9.9 \times 10^{-3}) \div (3 \times 10^2)$

5) A paperclip factory produces 5×10^2 paperclips a day. In a period of 1.5×10^3 days, how many can be produced?

Try These:

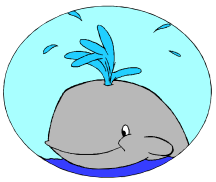
1) $(5 \times 10^{12})(1.1 \times 10^{3})$

2) $\dfrac{8.4 \times 10^{21}}{2.1 \times 10^{18}}$

3) $(2.4 \times 10^{8})(6 \times 10^{-2})$

4) $3.4 \times 10^{17} \div 2 \times 10^{9}$

5) An adult blue whale can eat 4.0×10^{7} krill in one day. At that rate, how many krill can an adult blue whale eat in 3.65×10^{2} days?



Lesson 5: Homework

1) $(6.2 \times 10^4)(3.2 \times 10^3)$

2) $\dfrac{(19.5 \times 10^5)}{(6.5 \times 10^{-4})}$

3) $(1.1 \times 10^{-5})(1.2 \times 10^2)$

4) $1.24 \times 10^1 \div 4 \times 10^5$

5) A newborn baby has about 26,000,000,000 cells. An adult has about 4.94×10^{13} cells. How many times as many cells does an adult have then a newborn? Write your answer in scientific notation.

Name _____ Math 8 Scientific Notation Lessons 1 – 4 Review

Lesson 1

Determine if the number in scientific notation would be written with a positive or negative exponent.

1) Total weight of 18-wheel truck _____ 2) Population in China _____

3) Size of a computer pixel _____ 4) Weight of an atom_____

Write each number in correct scientific notation

5) 29×10^{2} = _____ 6) $.17 \times 10^{-7}$ = _____

7) $.052 \times 10^{-4}$ = _____ 8) 386.4×10^{-6} = _____

Lesson 2

Write each of the following in scientific notation:

9) 25,000 _____ 10) .000302 _____

11) -4,700_____ 12) 2 million_____

Write each of the following in standard form:

13) 2.4×10^{7} _____ 14) 8×10^{3} _____

15) 8.1×10^{-4} _____ 16) 4.03×10^{-5} _____

What is the value of the missing exponent (n):

17) What is the value of n in the problem: $50{,}200{,}000 = 5.02 \times 10^{n}$ n = _____

18) What is the value of n in the problem: $0.00032 = 3.2 \times 10^{n}$ n = _____

19) What is the value of n in the problem: $31{,}000 = 3.1 \times 10^{n}$ n = _____

20) What is the value of n in the problem: $0.0000082 = 8.2 \times 10^{n}$ n = _____

Lesson 3

Compare: Use < , >, or =

21) 2.9×10^6 ◯ 2,900,000

22) 2.4×10^3 ◯ 2.41×10^3

23) 2.1×10^5 ◯ 1.1×10^7

24) 7.6×10^{-5} ◯ 4.8×10^{-3}

Lesson 4 Add, Subtract, Multiply, or Divide Without a Calculator

25) $(2.8 \times 10^7) + (4.1 \times 10^7) =$ _____

26) $(9.1 \times 10^8) - (3.8 \times 10^8) =$ _____

27) $(4.0 \times 10^{-4}) \times (2.1 \times 10^9) =$ _____

28) $(9.9 \times 10^{10}) \div (3.3 \times 10^9) =$ _____

Animal	Weight in ounces
Elephant	2.28×10^5
Cat	1.92×10^2
Mouse	3.2×10^{-1}
Zebra	9.6×10^3

29) Add - cat and zebra _____

30) Subtract - elephant minus cat _____

31) Multiply - mouse and zebra _____

32) Divide - zebra and mouse _____

Mixed Review

33) Which expression has the **greatest** value?

A) 1.045×10^2 B) 1.45×10^2 C) 8.4×10^{-2} D) -8.4×10^2

34) In the year 2000, approximately 169,000,000 personal computers were used in the United States. What is this number expressed in scientific notation?

A) 1.69×10^{-8} B) 16.9×10^{-7} C) 16.9×10^{7} D) 1.69×10^{8}

---

35) A butterfly weighs only about 5.0×10^{-5} of a kilogram. What is the number written in standard form?

A) 0.00005 B) 0.000005 C) 50,000 D) 500,000

---

36) The average distance from Pluto to the Sun is 3.65×10^{9} miles. What is this number written in standard form?

A) 365,000,000 B) 3,650,000,000 C) 36,500,000,000 D) 365,000,000,000

Extended Response:

37) The radius of a hydrogen atom is about 0.000000106 millimeter. Write the length of this radius in scientific notation.

Answer _____ millimeter(s)

On the lines below, explain how you determined your answer.

_____

_____

---

38) The table below shows geographic information about Antarctica.

ANTARCTICA

Area	1.4×10^{7} square kilometers
Lowest elevation	-2.56×10^{3} meters

Write the numbers, in standard form, for the area and the lowest elevation of Antarctica.

Answer:

Area _____square kilometers

Lowest elevation _____ meters

39) Ming wrote the four numbers below in scientific notation.

5.5×10^5 1.2×10^3 2.8×10^6 7.4×10^2

Put them in order least to greatest.

_____

40) Connor is researching four types of memory modules for his computer. The data are shown in the table below.

Module	Amount of Memory (in bytes)
W	3.64×10^8
X	1.28×10^9
Y	2.56×10^9
Z	5.12×10^8

Connor wants to buy the module with the most memory. Which module should he buy? _____

41) The table below shows the number of Earth days it takes for two of Jupiter's moons to make one full orbit around Jupiter.

JUPITER'S MOONS

Name	Orbit Time (in Earth Days)
Callisto	1.67×10^1
Themisto	1.3002×10^2

How **much longer**, in Earth days, does it take for Themisto to orbit Jupiter than it does for Callisto to orbit Jupiter? Write your answer in standard form.

Show your work.

Answer _____ Earth days

Lesson 7: Classwork

1. Which one doesn't belong? Explain your reasoning.

14.28×10^{9}	$(3.4 \times 10^{6})(4.2 \times 10^{3})$	1.4×10^{9}	$(3.4)(4.2) \times 10^{(6+3)}$

Use the table below for questions 2-4. The table below shows the debt of the three most populous states and the three least populous states.

State	**Debt (in dollars)**	**Population (2012)**
California	407,000,000,000	3.8×10^{7}
New York	337,000,000,000	1.9×10^{7}
Texas	276,000,000,000	2.6×10^{7}
North Dakota	4,000,000,000	6.9×10^{4}
Vermont	4,000,000,000	6.26×10^{4}
Wyoming	2,000,000,000	5.76×10^{4}

1. What is the sum of the **debts** for the 3 most populous states? Express your answer in scientific notation.

2. What is the sum of the **debts** for the 3 least populous states? Express your answer in scientific notation.

3. How much larger is the combined debt of the three most populated states than that of the three least populated states? Express your answer in scientific notation.

4. Here are the masses of the so-called inner planets of the Solar System.
Mercury: 3.3×10^{23} kg Earth: 5.9×10^{24} kg
Venus: 4.8×10^{24} kg Mars: 6.4×10^{23}

What is the average mass of all four inner planets? Write your answer in scientific notation.

6. What is the difference of 8.4×10^8 and 4.2×10^3 written in scientific notation?

1) 84 x 10^8
2) 8.4 x 10^9
3) 2 x 10^5
4) 8.4 x 10^8

---

7. What is the sum of 12 and 4.2×10^6 expressed in scientific notation?

1) 4.2 x 10^6
2) -4.2 x 10^6
3) 42 x 10^6
4) 42 x 10^7

---

8. What is the product of (6×10^3), (4.6×10^5), and (2×10^{-2}) expressed in scientific notation?

1) 55.2×10^6
2) 5.52×10^7
3) 55.2×10^7
4) 5.52×10^{10}

---

9. What is the quotient of 8.05×10^6 and 3.5×10^2?

1) 2.3×10^3
2) 2.3×10^4
3) 2.3×10^8
4) 2.3×10^{12}

---

10. What is the value of $\frac{6.3 \times 10^8}{3 \times 10^4}$ in scientific notation?

1) 2.1×10^{-2}
2) 2.1×10^2
3) 2.1×10^{-4}
4) 2.1×10^4

---

11. If the mass of a proton is 1.67×10^{-24} gram, what is the mass of 1,000 protons?

1) 1.67×10^{-27} g
2) 1.67×10^{-23} g
3) 1.67×10^{-22} g
4) 1.67×10^{-21} g

12. If the number of molecules in 1 mole of a substance is 6.02×10^{23}, then the number of molecules in 100 moles is

1) 6.02×10^{21}
2) 6.02×10^{22}
3) 6.02×10^{24}
4) 6.02×10^{25}

---

13. If you could walk at a rate of 2 meters per second, it would take you 1.92×10^8 seconds to walk to the moon. Is it more appropriate to report this time as 1.92×10^8 or 6.02 years?

---

14. The areas of the world's oceans are listed in the table. Order the oceans according to their area from least to greatest.

Ocean	Area (ml^2)
Atlantic	2.96×10^7
Arctic	5.43×10^6
Indian	2.65×10^7
Pacific	6×10^7
Southern	7.85×10^6

---

15. Mr. Murphy's yard is 2.4×10^2 feet by 1.15×10^2 feet. Calculate the area of Mr. Murphy's yard.

---

16. Every day, nearly 1.30×10^9 spam E-mails are sent worldwide! Express in scientific notation how many spam e-mails are sent each year.

---

17. In 2005, 8.1×10^{10} text messages were sent in the United States. In 2010, the number of annual text messages had risen to 1,810,000,000,000. About how many times as great was the number of text messages in 2010 than 2005?

---

18. Let M = 993,456,789,098,765. Find the smallest power of 10 that will exceed M.

Lesson 6: Homework

1. All planets revolve around the sun in elliptical orbits. Uranus's furthest distance from the sun is approximately 3.004×10^9 km, and its closest distance is approximately 2.749×10^9 km. Using this information, what is the average distance of Uranus from the sun?

---

2. A micron is a unit used to measure specimens viewed with a microscope. One micron is equivalent to 0.00003937 inch. How is this number expressed in scientific notation?

1) $3.937 \, x \, 10^5$
2) $3937 \, x \, 10^{-8}$
3) $3937 \, x \, 10^8$
4) $3.937 \, x \, 10^{-5}$

---

3. The distance from Earth to the Sun is approximately 93 million miles. A scientist would write that number as

1) $93 \, x \, 10^7$
2) $93 \, x \, 10^{10}$
3) $9.3 \, x \, 10^6$
4) $9.3 \, x \, 10^7$

---

4. By the year 2050, the world population is expected to reach 10 billion people. When 10 billion is written in scientific notation, what is the exponent of the power of ten?

---

5. The table shows the mass in grams of one atom of each of several elements. List the elements in order from the least mass to greatest mass per atom.

Element	Mass per Atom
Carbon	1.995×10^{-23}
Gold	3.272×10^{-22}
Hydrogen	1.674×10^{-24}
Oxygen	2.658×10^{-23}
Silver	1.792×10^{-22}

---

6. A music download Web site announced that over 4×10^9 songs were downloaded by 5×10^7 registered users. What is the average number of downloads per user?

7. Sara's bedroom is 2.4×10^3 inches by 4.35×10^2 inches. How many carpeting would it take to cover her floor? Express your answer in scientific notation.

8. The area of Alaska is 5.55×10^2 times greater than the area of Rhode Island, which is 2.4×10^7 meters. How many kilometers is the area of Alaska? Express your answer in scientific notation.

Review Work:

9. What is the perimeter of a fenced-in yard with corresponding sides of $5x + 12$ and $3x - 7$?

10. Three-fourths of a pan of lasagna is to be divided equally among 6 people. What part of the lasagna will each person receive?

11. The tallest mountain in the United State is Mount McKinley in Alaska. The elevation is about $2^2 \times 5 \times 10^3$. What is the height of Mount McKinley?

12. The mass of a baseball glove is $5 \times 5 \times 5 \times 5$. Write the mass in exponential form, and then find the value of the expression.

Lesson 7
Add, Subtract, Multiply, and Divide With a Calculator

Rules for Multiplying and Dividing Numbers in Scientific Notation

1 - Put your calculator in Sci. Not. Mode

2 - Type the problem into the calculator EXACTLY how it is written.

How to multiply and divide numbers in scientific notation:

- You MUST use parentheses **( )** when inputting each number in scientific notation!
- To input an exponent, enter the base then hit (^) before entering the exponent.
- Hit (−) first if you need to make a number negative.
- Simple numbers like (1.2×10^4) can be inputted like this:

(	1	.	2	x	10	^	4	=

Examples:

1) $(3.4 \times 10^3)(1.2 \times 10^4)$

Enter the following:

(	3	.	4	x	1	0	^	3	)	x	(	1	.	2	x	1	0	^	4	)

Answer:

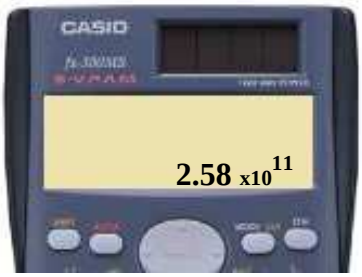
$(3.4 \times 10^3)(1.2 \times 10^4) = \underline{4.08 \times 10^7}$

2) $(9.3 \times 10^{5}) \div (3.6 \times 10^{-6})$

Enter the following:

(	9	.	3	x	1	0	^	5	)	÷	(	3	.	6	x	1	0	^	-	6	)

Answer:



$(9.3 \times 10^{5}) \div (3.6 \times 10^{-6}) = \underline{2.58 \times 10^{11}}$

---

3) $(7.2 \times 10^{2}) + (1.6 \times 10^{4})$

4) $(9.24 \times 10^{9}) - (6.89 \times 10^{3})$

---

5) $(1.263 \times 10^{-2})(1.525 \times 10^{2})$

6) $\dfrac{9 \times 10^{10}}{7.36 \times 10^{-5}}$

Remember:
If the problem doesn't have parentheses put them (in) the problem.

Try These:

---

1. $(9.87 \times 10^{5})(4.45 \times 10^{0})$

2. $(9.24 \times 10^{9}) \div (6.89 \times 10^{3})$

---

3. $(4.18 \times 10^{-4}) + (.0009)$

4. $(4.18 \times 10^{-4}) - (9 \times 10^{-4})$

---

5. $(6.75 \times 10^{-3})(3.26 \times 10^{8})(2 \times 10^{-2})$

6. $\dfrac{(6.12 \times 10^{7})(2.22 \times 10^{-5})}{(3.54 \times 10^{2})} =$ _____ =

---

7. $(2.6 \times 10^{5}) + (1.9 \times 10^{2})$

8. $(8.37 \times 10^{8}) \div 27{,}000$

Lesson 7 Classwork/Homework

1. $(8.4 \times 10^{2})(2.5 \times 10^{6})$

2. $(2.63 \times 10^{4}) + (1.2 \times 10^{-3})$

3. $(7.83 \times 10^{8})(1.161 \times 10^{7})$

4. $(8.4 \times 10^{2}) \div (2.5 \times 10^{6})$

5. $(9 \times 10^{-11}) - (2.4 \times 10^{8})$

6. $(9.45 \times 10^{5}) \div (2.4 \times 10^{2})$

7. $87{,}000{,}000 + (8.7 \times 10^{5})$

8. $(1.14 \times 10^{6})(4.8 \times 10^{-6})$

9. $(1.03 \times 10^{-9}) - (4.7 \times 10^{7})$

10. $(8.4 \times 10^{2})(2.5 \times 10^{6})$

11. $(9 \times 10^{-11}) \div (2.4 \times 10^{8})$

12. $(9.45 \times 10^{5}) + (2.4 \times 10^{2})$

Word problems:

The table below shows the approximate populations of 3 countries.

Country	China	France	Australia
Population	1.3×10^{9}	6.48×10^{7}	2.15×10^{7}

13. What is the total population of China, France, and Australia?

14. How many more people live in France than in Australia?

15. The area of Australia is 2.95×10^{6} square miles. What is the approximate average number of people per square mile in Australia?

16. How many times greater is the population of China than the population of France? Write your answer in standard notation.

Name_____ 8R Unit 11 Review Scientific Notation

Write the following in Standard Form:

1) 6.3×10^{7} 2) 5.23×10^{-4} 3) 8.08×10^{0} 4) 4.2×10^{-1} 5) 9.24×10^{10}

Write the following using Scientific Notation:

6) 120 7) 65,002,000 8) 0.0000233 9) .345 x 10^{4} 10) 523 x 10^{9}

Find the value of the following. Write your answer in Scientific Notation.

11) $(4.3 \times 10^{7})(2.2 \times 10^{3})$ 12) $(5 \times 10^{12})(4.77 \times 10^{-5})$ 13) $(3.6 \times 10^{-5})^{3}$

14) $\frac{6.2\times10^{9}}{2\times10^{2}}$ 15) $(3.45 \times 10^{6}) \div (8.01 \times 10^{-5})$ 16) $\frac{1.6332\times10^{11}}{1.6332\times10^{11}}$

17) $(4.3 \times 10^{7}) + (7.2 \times 10^{7})$ 18) $(5.32 \times 10^{12}) - (2.9 \times 10^{3})$ 19) $(2 \times 10^{7}) + (5.6 \times 10^{3})$

Compare using < > =

20) 5.3 x 10^{3} ◯ 4.5 x 10^{3} 21) 2300 ◯ 2.3 x 10^{3}

Word Problems: Add, Subtract, Multiple, or Divide

22) How many times larger is 9.8×10^6 than 6.32×10^5?

23) Find the mass of 2.7×10^{15} hydrogen atoms if the mass of one hydrogen atom is 1.67×10^{-24} grams.

24) The distance from the Earth to the star Alpha Centauri is about 4.07×10^{13} kilometers. If light travels at a speed of about 3.0×10^5 kilometers per second, how long does it take light to travel from the star to Earth?

25) In 1867, the United States purchased Alaska from Russia for $7.2 million. The total area of Alaska is about 3.78×10^8 acres. What was the price per acre?

26) Consider a person whose heart beats 70 times per minute, and lives to be 85 years old. How many times would their heart beat in their lifetime (excluding leap years)? Write your answer in scientific notation.

27) If the population in New York City is 3.2×10^7 and the population on Long Island is 1.68×10^5, how many people live in these two areas combined? Express your answer in scientific notation.

28) The masses of the following planets in a given solar system are listed below.

Planet A: 3.24×10^{24} Planet B: 5.673×10^{25}

Planet C: 2.178×10^{25} Planet D: 3.923×10^{24}

What is the average mass of all four planets? Write your answer in scientific notation.

Mixed Review Simplify:

29) $8x - 2y + 6x - y$

30) $-5(-2x + 7) - 5$

Simplify:

31) $5^5 \cdot 5^7$

32) $2^6 \cdot 2^{-9}$

33) $\frac{9^8}{9^4}$

34) $6^{-10} \div 6^3$

35) $\frac{6}{0}$

Solve.

36) $4(-3x + 2) = 44$

37) $4(x - 2) = 3m + 5$

38) $4x + 2 = 5x - 3 - x$

---

39) Convert 68 degrees Fahrenheit to Celsius. $C = \frac{5}{9}(F - 32)$

---

40) Find the slope of the line which passes through points (6,3) and (4, -5)

---

41) Find the volume of a prism when $l = 10$, $w = 8$, and $h = 6$

---

42) Find the volume of a cylinder when $r = 5$ and $h = 8$

---

43) Write the equation of a line whose slope = 2 and y-intercept = -6

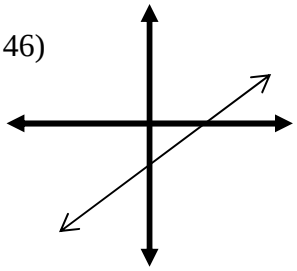
---

44) Reflect point A (2,5) over the *x* axis.

45) Reflect point B (-5,6) over the *y* axis.

Name the type of slope.

46)



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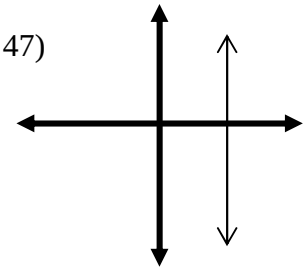

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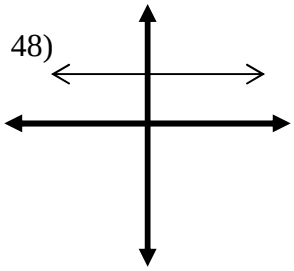

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