

Grade

8

# Geometry


## Worksheets

**Geometry - 8.G.1**


Describe in your own words what the following means:

- 1) Translation =
- 2) Reflection =
- 3) Rotation =
- 4) Determine which of the following are true or false. If false, make the statement true.

**Figure A**




**Figure B**




Figure(s):

- 5) Determine which of the following are true or false. If false, make the statement true.


**Figure A**




**Figure B**



**Figure C**



**Figure D**



Figure(s):

**Geometry - 8.G.2**

Determine if the following statements are true or false. If false, make the statement true.

- 1) A two dimensional figure is congruent to another if it is obtained through translations, rotations, or reflections.
- 2) Translations flip an object.
- 3) Reflections slide an object.
- 4) Rotations turn an object.
- 5) For a figure to be congruent to another, it must be the same size and shape.
- 6) Explain in your own words what it means for two dimensional figures to be congruent.
- 7) Give an example of a congruent figure to the right.
- 8) Give an example of a congruent figure across the y-axis.
- 9) Give an example of a congruent figure clockwise.

**Geometry - 8.G.3**

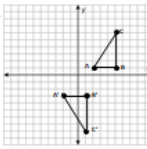
Use the coordinate plane provided to graph the pre-image and image with the given transformations.

- 1) Translate Triangle ABC with vertices A(3, 4), B(5, 1) and C(3, 1) to the left 5 units and down 2 units.
- 2) Rotate Square LMNP with vertices L(-2, 1), M(-2, 4), N(2, 4) and P(2, 1) 90 degrees counter-clockwise.
- 3) Reflect Triangle EFG with vertices E(-2, -2), F(-2, -5) and G(-5, -3) across the y-axis.
- 4) Dilate Square VWXY with vertices V(1, -3), W(3, -3), X(3, 1) and Y(1, 1) by a scale factor of 2.

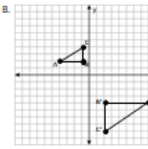
**Geometry - 8.G.4**

1. Graph a rectangle by graphing points A(1, 1), B(4, 1), C(4, 4), and D(1, 4).
- A. Reflect the image across the x-axis and record the new coordinates.  
A. \_\_\_\_\_ B. \_\_\_\_\_ C. \_\_\_\_\_ D. \_\_\_\_\_
- B. Rotate the image 180 degrees and record the new coordinates.  
A. \_\_\_\_\_ B. \_\_\_\_\_ C. \_\_\_\_\_ D. \_\_\_\_\_
- C. Translate the figure up 4 units and right 6 units. Record the new coordinates.  
A. \_\_\_\_\_ B. \_\_\_\_\_ C. \_\_\_\_\_ D. \_\_\_\_\_
- D. Is the figure similar to the original rectangle you graphed? Explain.
2. The following figures are similar. Describe a sequence that shows the similarity between them.

**A.**



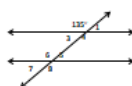
**B.**



**Geometry - 8.G.5**

Determine if the following statements are true or false using the diagram.

- 1) Angles 5 and 7 are vertical angles.
- 2) The value of angle 6 is  $135^\circ$ .
- 3) The value of angle 1 is  $35^\circ$ .
- 4) Angles 3 and 6 are alternate interior angles.
- 5) Angles 1 and 8 are corresponding angles.



**Geometry - 8.G.9**

Write down the formulas for the following:

- 1) Volume of a Cone =
- 2) Volume of a Cylinder =
- 3) Volume of a Sphere =

Find the volume of the following figures. Round your answer to the nearest hundredth.

- 1) A cylinder with a radius of 2.5 m and a height of 8 m.
- 2) A cone with a diameter of 12 ft and a height of 14 ft.
- 3) A sphere with a radius of 10 inches.
- 4) A tennis ball with a diameter of 2.5 inches.
- 5) A cone with a diameter of 15 inches and a height of 10 inches.
- 6) A cylinder with a diameter of 29 feet and a height of 8 cm.
- 7) An ice cream cone with a radius of 7 cm and a height of 8 cm.

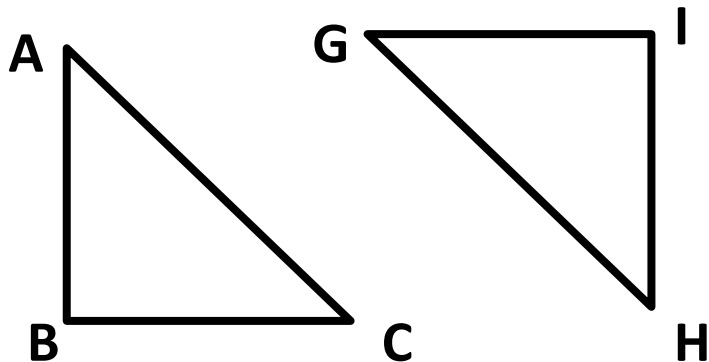


By: Math in the Midwest

## Geometry – 8.G.1

Use patty paper to figure out which sides of the congruent figures are corresponding and which angles are corresponding.

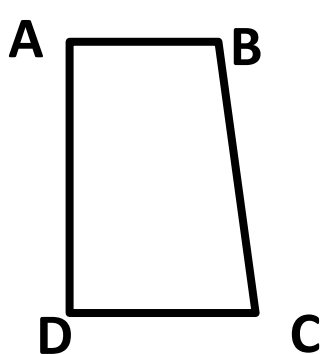
1)



Corresponding Sides:

Corresponding Angles:

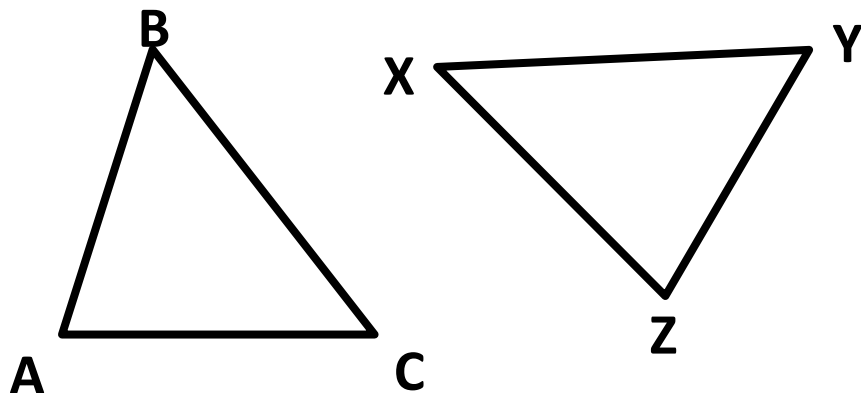
2)



Corresponding Sides:

Corresponding Angles:

3)



Corresponding Sides:

Corresponding Angles:

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Hour: \_\_\_\_\_

## Geometry – 8.G.1

Describe in your own words what the following means:

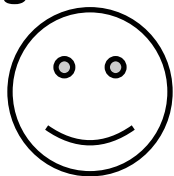
1) Translation –

2) Reflection –

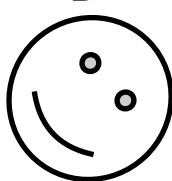
3) Rotation

4) Determine which of the following figures are congruent from only translating figure A

**Figure A**



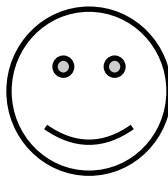
**B**



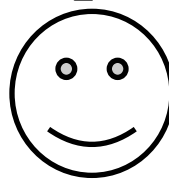
**C**



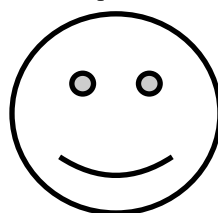
**D**



**E**



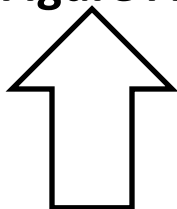
**F**



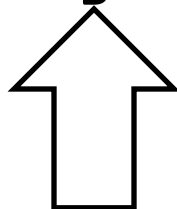
Figure(s): \_\_\_\_\_

5) .Determine which of the following figures are congruent from only reflecting Figure A.

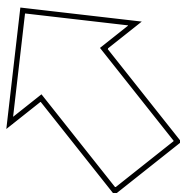
**Figure A**



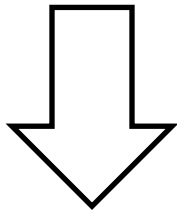
**B**



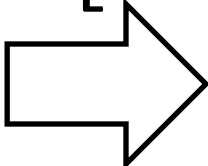
**C**



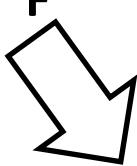
**D**



**E**



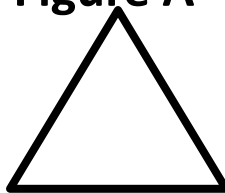
**F**



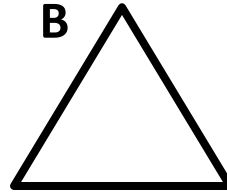
Figure(s): \_\_\_\_\_

6) .Determine which of the following figures are congruent from only rotating Figure A.

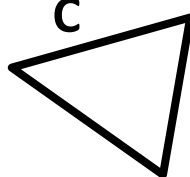
**Figure A**



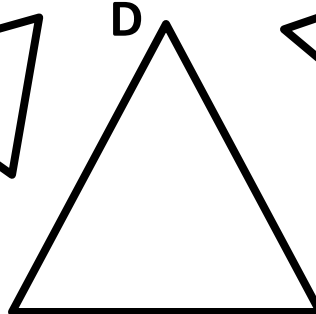
**B**



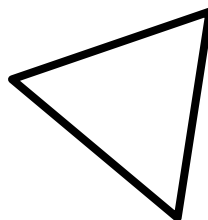
**C**



**D**



**E**



Figure(s): \_\_\_\_\_

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Hour: \_\_\_\_\_

## Geometry – 8.G.1

**Answer the following questions about a translation:**

- 1) What stays the same after a translation?
- 2) What changes after a translation?
- 3) What do you need to know in order to perform a translation?
- 4) Draw an example of a translation.

**Answer the following questions about a reflection.**

- 5) What stays the same after a reflection?
- 6) What changes after a reflection?
- 7) What do you need to know in order to perform a reflection?
- 8) Draw an example of a reflection.


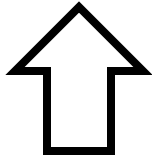

**Answer the following questions about a rotation.**

- 9) What stays the same after a rotation?
- 10) What changes after a rotation?
- 11) What do you need to know in order to perform a rotation?
- 12) Draw an example of a rotation.

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Hour: \_\_\_\_\_

## Geometry – 8.G.2

Determine if the following statements are true or false. If false make the statement true.

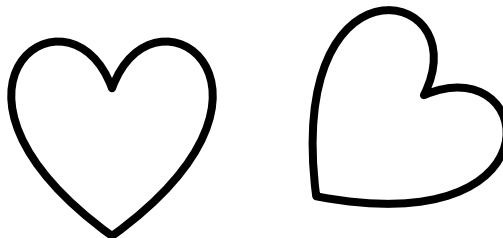
- 1) \_\_\_\_\_ A two dimensional figure is congruent to another if it obtained through translations, rotations, or reflections.
- 2) \_\_\_\_\_ Translations flip an object.
- 3) \_\_\_\_\_ Reflections slide an object.
- 4) \_\_\_\_\_ Rotations turn an object.
- 5) \_\_\_\_\_ For a figure to be congruent in must be the same size and shape.
- 6) Explain in your own words what it means for a two dimensional figure to be congruent to another two dimensional figure.
- 7) Give an example of a congruent figure that is obtained by translating the following pre-image to the right.  

- 8) Give an example of a congruent figure that is obtained by reflecting the following pre-image across the  $y$  – axis.  

- 9) Give an example of a congruent figure that is obtained by rotating the following pre-image clockwise.  


Name: \_\_\_\_\_ Date: \_\_\_\_\_ Hour: \_\_\_\_\_

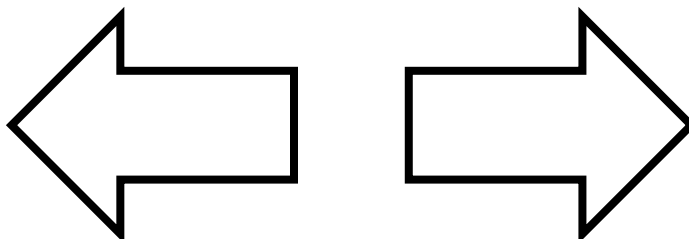
## Geometry – 8.G.2

The following figures in each of the problems are congruent. Determine the sequence between the two congruent figures. Note the pre-image is always on the left and the image on the right.

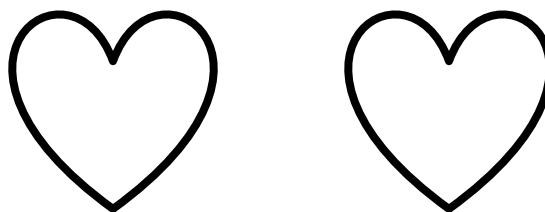
1) \_\_\_\_\_



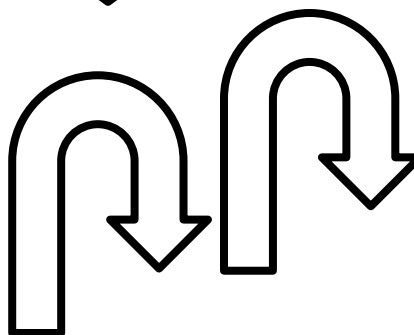
2) \_\_\_\_\_



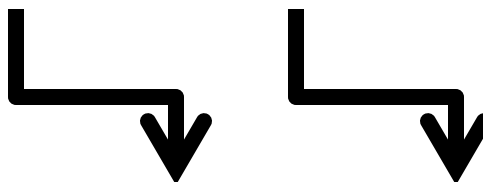
3) \_\_\_\_\_



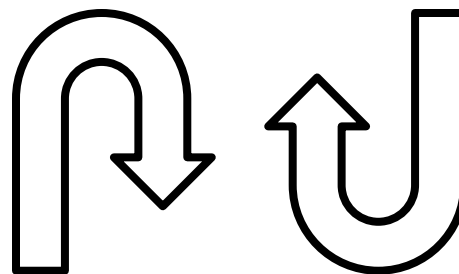
4) \_\_\_\_\_



5) \_\_\_\_\_



6) \_\_\_\_\_



Name: \_\_\_\_\_ Date: \_\_\_\_\_ Hour: \_\_\_\_\_

## Geometry – 8.G.3

Match each of the descriptions with the correct representation of the transformation rule.

\_\_\_\_\_ 1. Translation 4 left and 3 up

\_\_\_\_\_ 2. Rotation 180 degrees

\_\_\_\_\_ 3. Reflection over the y-axis

\_\_\_\_\_ 4. Reflection over the x-axis

\_\_\_\_\_ 5. Translation 4 right and 3 down

\_\_\_\_\_ 6. Rotation 90 degrees counter clockwise.

A.  $(x, -y)$

B.  $(x + 4, y - 3)$

C.  $(x - 4, y + 3)$

D.  $(-y, x)$

E.  $(-x, -y)$

F.  $(-x, y)$

Write what the new ordered pairs of the points would be after the given transformation:

7) Find the image of  $(2, 5)$  reflected across the y-axis.

8) Find the image of  $(2, 5)$  translated 3 units right and 2 units up.

9) Find the image of  $(2, 5)$  rotated 180 degrees.

10) Find the image of  $(2, 5)$  reflected across the x-axis.

11) Find the image of  $(2, 5)$  translated 5 units left and 1 unit up.

12) Find the image of  $(2, 5)$  rotated 90 degrees clockwise.

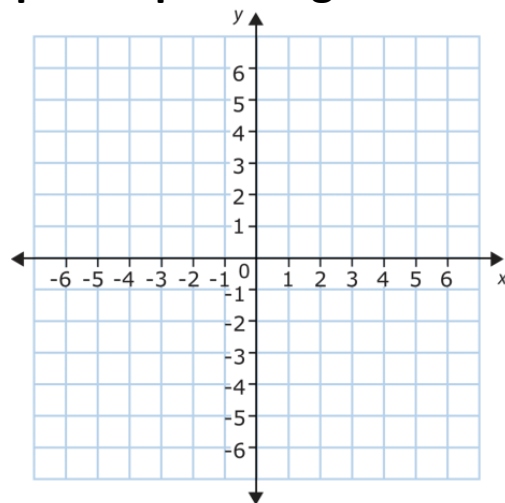
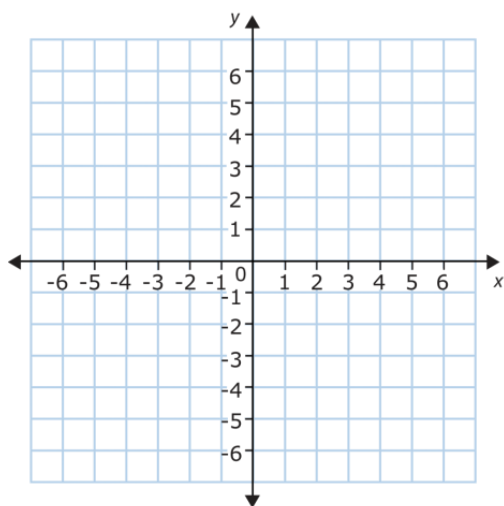
13) Find the image of  $(2, 5)$  dilated by a scale factor of  $\frac{1}{2}$ .

14) Find the image of  $(2, 5)$  dilated by a scale factor of 4.

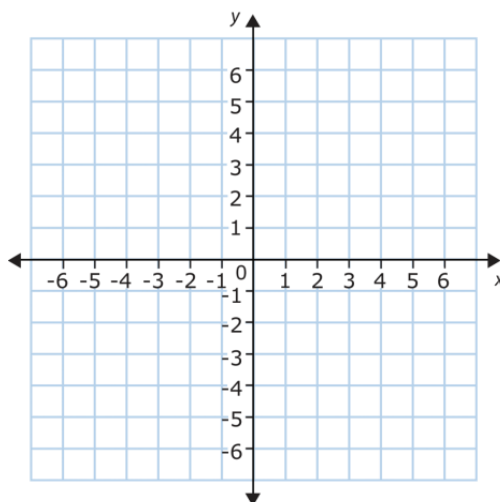
## Geometry – 8.G.3

Use the coordinate plane provided to graph the pre-image and image with the given transformations.

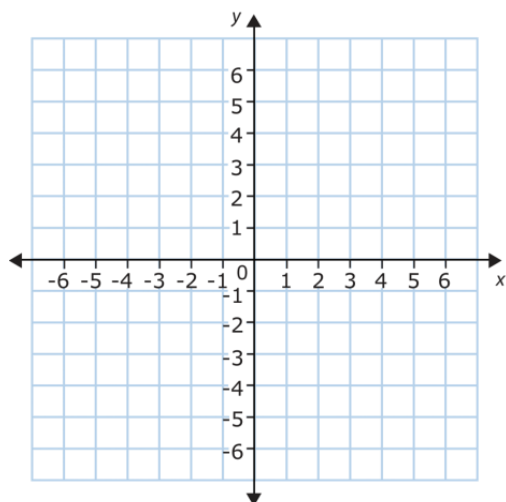
- 1) Translate Triangle ABC with vertices  $A(3, 4)$ ,  $B(5, 1)$  and  $C(3, 1)$  to the left 5 units and down 2 units.



- 2) Rotate Square LMNO with vertices  $L(-2, 1)$ ,  $M(-2, 4)$ ,  $N(-4, 4)$  and  $O(-4, 1)$  90 degrees counterclockwise.



- 3) Reflect Triangle EFG with vertices  $E(-2, -2)$ ,  $F(-2, -5)$  and  $G(-5, -3)$  across the y-axis.



- 4) Dilate Square VWXY with vertices  $V(1, -3)$ ,  $W(2, -3)$ ,  $X(1, -2)$  and  $Y(2, -2)$  by a scale factor of 2.



Name: \_\_\_\_\_ Date: \_\_\_\_\_ Hour: \_\_\_\_\_

## Geometry – 8.G.4

Determine if the following scale factors would be an enlargement or a reduction.

- \_\_\_\_\_ Scale Factor: 2.5
- \_\_\_\_\_ Scale Factor:  $\frac{3}{4}$
- \_\_\_\_\_ Scale Factor: 0.1
- \_\_\_\_\_ Scale Factor  $\frac{8}{3}$
- \_\_\_\_\_ Scale Factor: 5
- Explain in your own words how you know if the figure will be an enlargement or a reduction when dilating.
- Explain in your own words what it means for two figures to be similar.
- Graph a rectangle by graphing points A(1, 1), B (4, 1), C(4, 4), and D (1, 4).

A. Dilate the figure with respect to the origin by a scale factor of 2. Label the new coordinates:

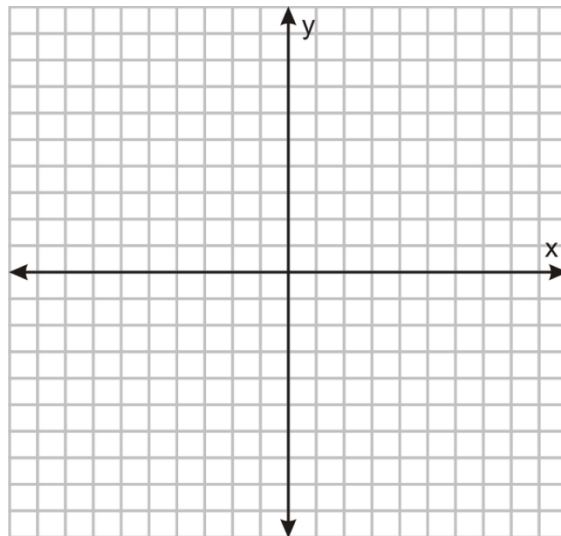
A \_\_\_\_\_ B \_\_\_\_\_ C \_\_\_\_\_ D \_\_\_\_\_

B. Reflect the image across the y axis and record the new coordinates:

A \_\_\_\_\_ B \_\_\_\_\_ C \_\_\_\_\_ D \_\_\_\_\_

C. Translate the figure down 12 units and right 5 units. Record the new coordinates:

A \_\_\_\_\_ B \_\_\_\_\_ C \_\_\_\_\_ D \_\_\_\_\_



Name: \_\_\_\_\_ Date: \_\_\_\_\_ Hour: \_\_\_\_\_

## Geometry – 8.G.4

1. Graph a rectangle by graphing points A(1, 1), B (4, 1), C(4, 4), and D (1, 4).

A. Reflect the image across the x axis and record the new coordinates:

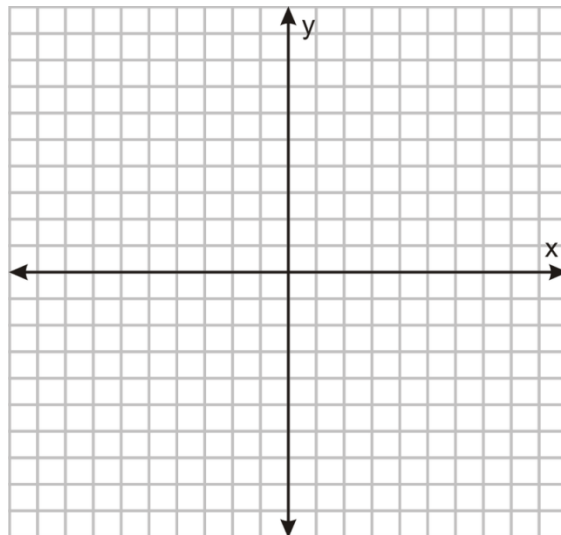
A \_\_\_\_\_ B \_\_\_\_\_ C \_\_\_\_\_ D \_\_\_\_\_

B. Rotate the image 180 degrees and record the new coordinates:

A \_\_\_\_\_ B \_\_\_\_\_ C \_\_\_\_\_ D \_\_\_\_\_

C. Translate the figure up 4 units and right 6 units. Record the new coordinates:

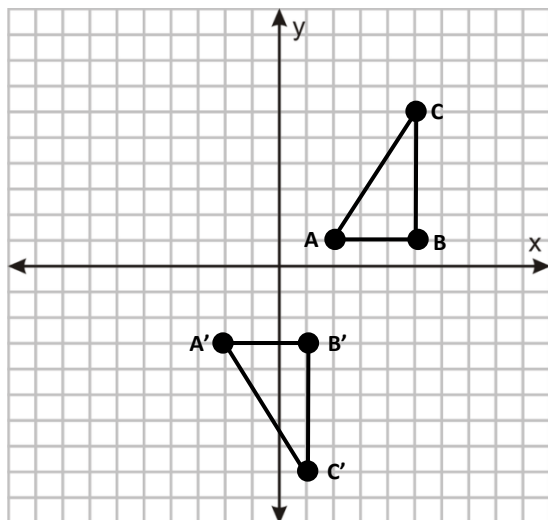
A \_\_\_\_\_ B \_\_\_\_\_ C \_\_\_\_\_ D \_\_\_\_\_



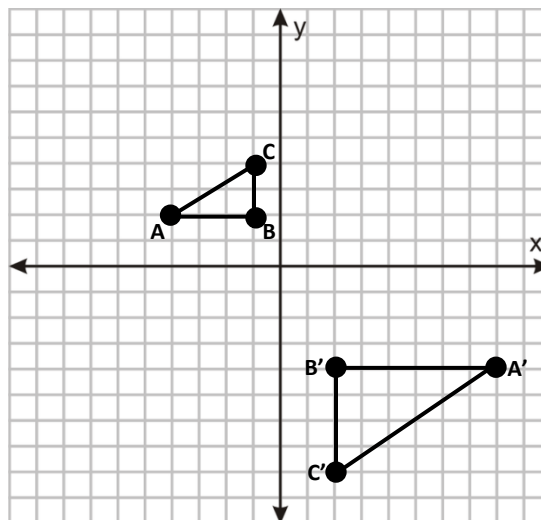
D. Is this figure similar to the original rectangle you graphed? Explain.

2. The following figures are similar. Describe a sequence that shows the similarity between them.

A.



B.

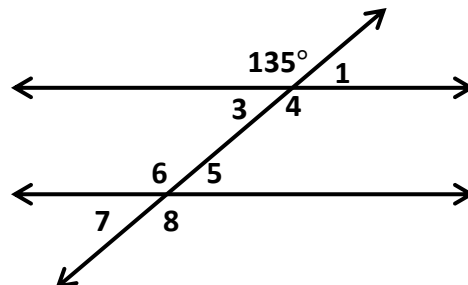


Name: \_\_\_\_\_ Date: \_\_\_\_\_ Hour: \_\_\_\_\_

## Geometry – 8.G.5

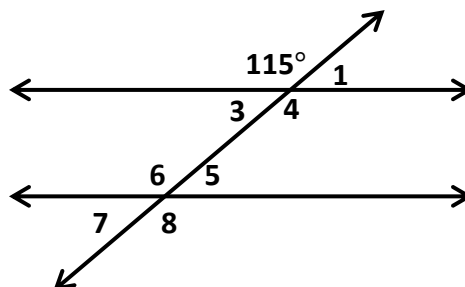
Determine if the following statements are true or false using the diagram.

- 1) \_\_\_\_\_ Angles 5 and 7 are vertical angles.
- 2) \_\_\_\_\_ The value of angle 6 is  $135^\circ$
- 3) \_\_\_\_\_ The value of angle 1 is  $35^\circ$ .
- 4) \_\_\_\_\_ Angles 3 and 6 are alternate interior angles.
- 5) \_\_\_\_\_ Angles 1 and 8 are corresponding angles.



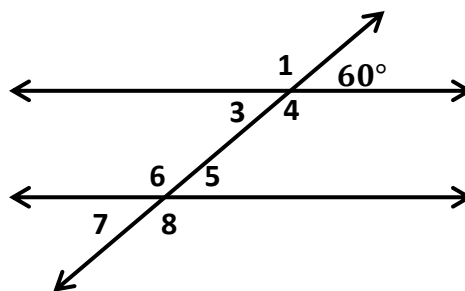
6) Find the measure of all 7 angles given that one of the angles is  $115^\circ$ .

- |                 |                 |
|-----------------|-----------------|
| Angle 1 = _____ | Angle 5 = _____ |
| Angle 2 = _____ | Angle 6 = _____ |
| Angle 3 = _____ | Angle 7 = _____ |
| Angle 4 = _____ |                 |



Determine if the following statements are true or false using the diagram.

- 7) \_\_\_\_\_ Angles 3 and 4 are supplementary angles
- 8) \_\_\_\_\_ Angle 7 is  $60^\circ$ .
- 9) \_\_\_\_\_ Angle 3 and angle 6 are corresponding angles.
- 10) \_\_\_\_\_ Angles 5 and 8 are complementary angles.
- 11) \_\_\_\_\_ Angles 1 and 4 are vertical angles.
- 12) \_\_\_\_\_ Angles 4 and 5 are supplementary angles.

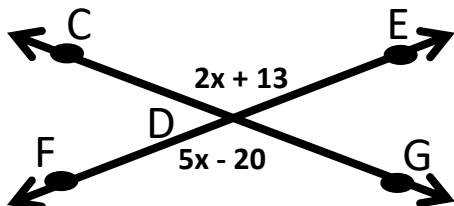


## Geometry – 8.G.5

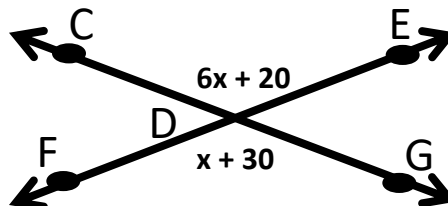
Answer the following questions. **SHOW ALL OF YOUR WORK!**

Note: The images are not drawn to scale.

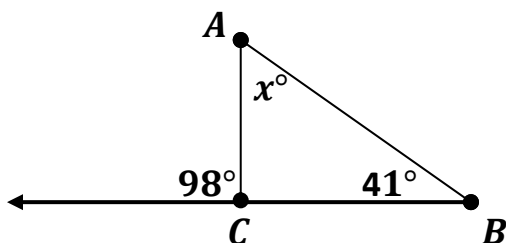
- 1) Find the  $m\angle FDG$



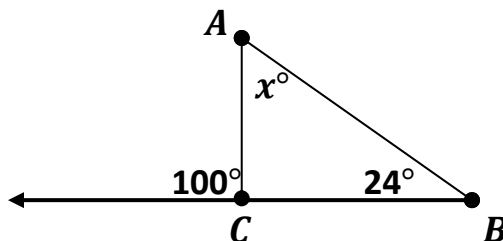
- 2). Find the  $m\angle EDG$



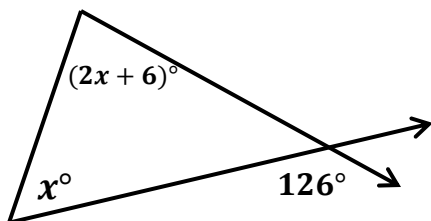
- 3) Find the unknown angle measure.



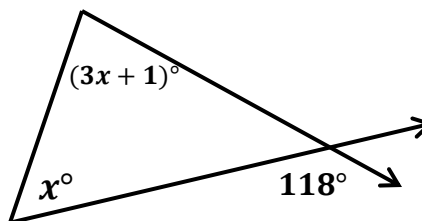
- 4) Find the unknown angle measure.



- 5) Write an equation and solve for x.



- 6) Write an equation and solve for x.

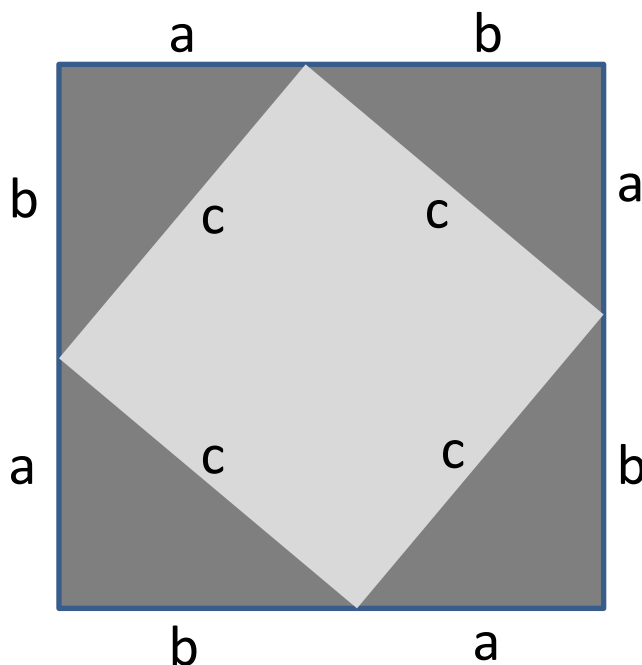


Name: \_\_\_\_\_ Date: \_\_\_\_\_ Hour: \_\_\_\_\_

## Geometry – 8.G.6

Fill in the blanks on the following problems to show a proof of the Pythagorean Theorem using Algebra.

Using this diagram will help you, it has four “abc” triangles in it.



1) Area of the Whole Square

It is a big square, with each side having a length of  $a + b$ , so the total area of the whole square is

$A =$  \_\_\_\_\_

2) Area of the smaller (titled) square:

$A =$  \_\_\_\_\_

3) Area of one triangle:

$A =$  \_\_\_\_\_

4) Area of all four triangles:

$A =$  \_\_\_\_\_

5) Sum of the titled square and the 4 triangles:

$A =$  \_\_\_\_\_

6) The area of the large square is equal to the area of the titled square and the 4 triangles. Take your two expressions and set them equal to each other. For example

Area of Large Square (Question 1) = Area of Titled Square + Triangle (Question 5)

\_\_\_\_\_ = \_\_\_\_\_

7) When you expand  $(a + b)(a + b)$  it equals  $a^2 + 2ab + b^2$ . Subtract  $2a$  from both sides and see what you get!

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Hour: \_\_\_\_\_

## Geometry – 8.G.6

1) What is the Pythagorean Theorem: \_\_\_\_\_

2) a and b are referred to as : \_\_\_\_\_

3) C is referred to as the: \_\_\_\_\_

**Determine what type of triangle is formed by each set of numbers**

4) 3, 4, 5

5) 9, 9, 13

6) 11, 11, 15

7) 7, 7, 7

8) 6, 8, 10

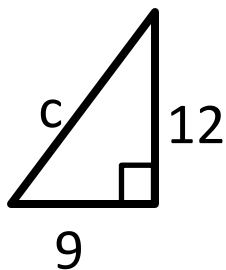
9) 8, 10, 12

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Hour: \_\_\_\_\_

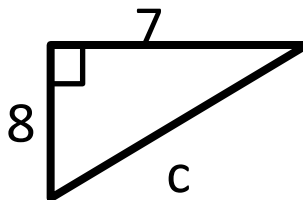
## Geometry – 8.G.7

Find the length of the missing side to the nearest tenth.

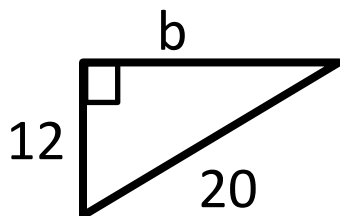
1.



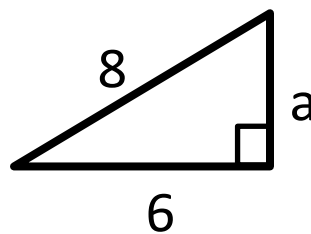
2.



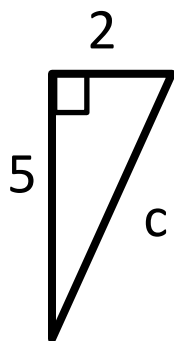
3.



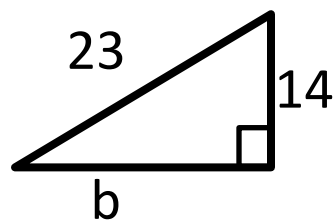
4.



5.



6.



Name: \_\_\_\_\_ Date: \_\_\_\_\_ Hour: \_\_\_\_\_

## Geometry – 8.G.7

**Solve the following word problems – Show all your work!**

1. A baseball diamond is a square with sides of 90 feet. What is the distance, to the nearest tenth of a foot, between home and second base?
2. Two joggers run 9 miles north and then 3 miles west. What is the shortest distance, to the nearest tenth of a mile, they must travel to return to their starting point?
3. A soccer field is a rectangle 90 meters wide and 120 meters long. The coach asks players to run from one corner to the corner diagonally across. What is the distance to the nearest tenth of a meter?
4. Amy leaves the house to go get ice cream. She walks 2 miles west and 3 miles north. How far away is Amy from her starting point?
5. Mr. Smith tells you that a right triangle has a hypotenuse of 19 and a leg of 10. He asks you to find the other leg of the triangle. What is your answer?
6. A cat is stuck on the roof. If the ladder is 12 feet long and must be placed seven feet away from the building. How high can the ladder reach up the building to help save the cat?
7. Blake made a rectangular table for his dining room. The sides of the table are 12 feet and 4 feet. What is the length of the diagonal of the table?
8. A fire truck parks 16 feet away from a building. The fire truck extends its ladder 30 feet to the very top of the building. How tall is the building?



Name: \_\_\_\_\_

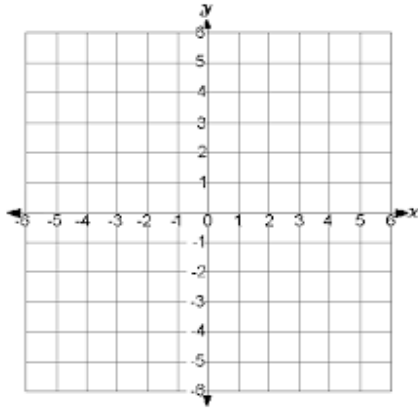
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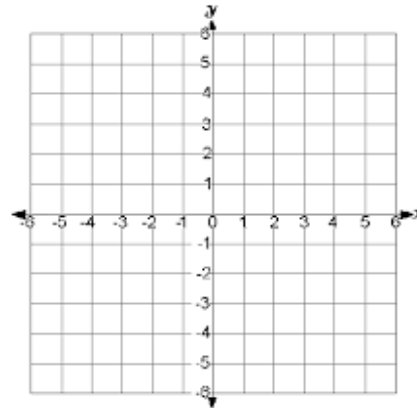
## Geometry – 8.G.8

Find the distance between the following points:

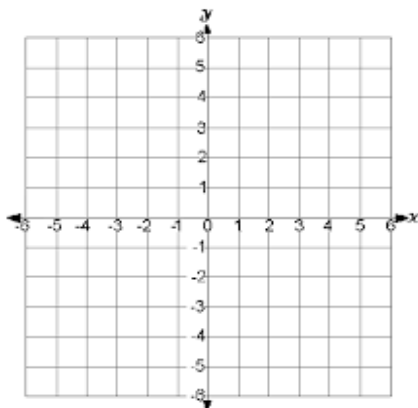
1.  $(-6, 4)$  and  $(5, 1)$



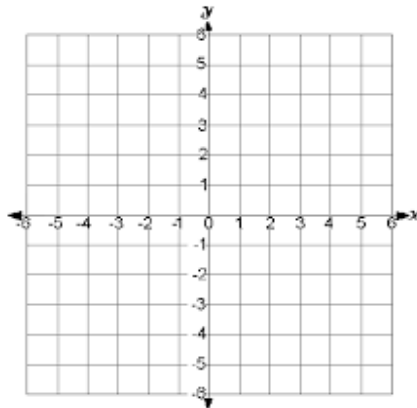
2.  $(-2, 6)$  and  $(-2, -2)$



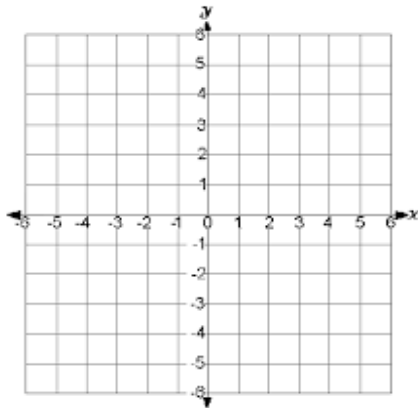
3.  $(7, 0)$  and  $(-5, -6)$



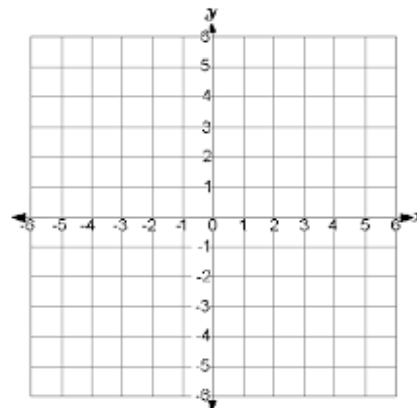
4.  $(-4, 0)$  and  $(8, -3)$



5.  $(6, 4)$  and  $(1, 1)$



6.  $(-5, -2)$  and  $(0, 3)$



Name: \_\_\_\_\_

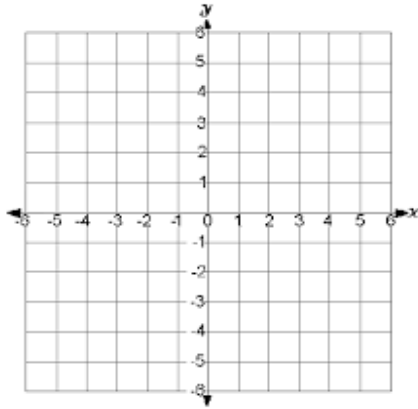
Date: \_\_\_\_\_

Hour: \_\_\_\_\_

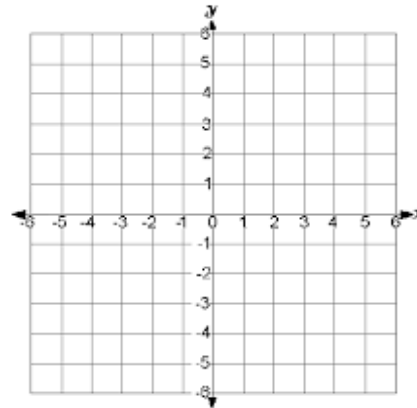
## Geometry – 8.G.8

Find the distance between the following points:

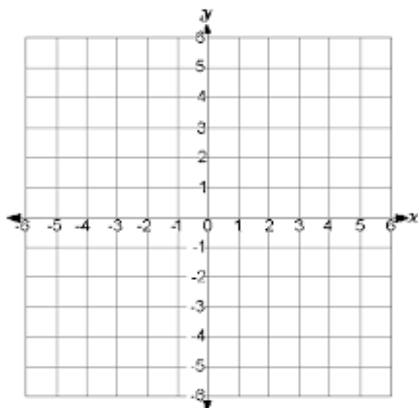
1.  $(-1, -4)$  and  $(3, -1)$



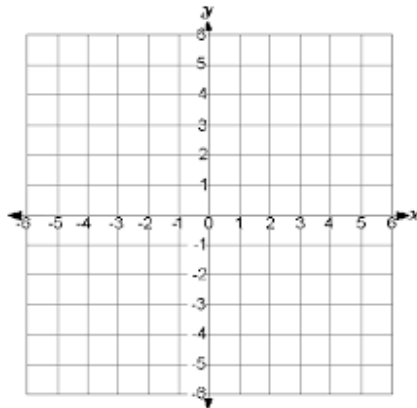
2.  $(0, 6)$  and  $(5, 0)$



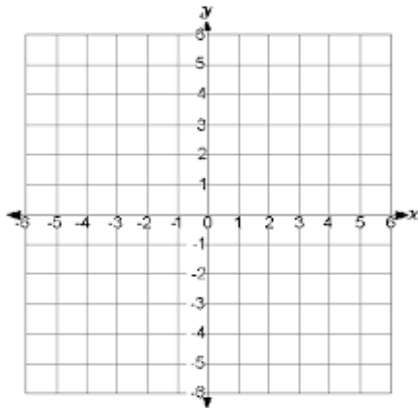
3.  $(4, 5)$  and  $(-3, -3)$



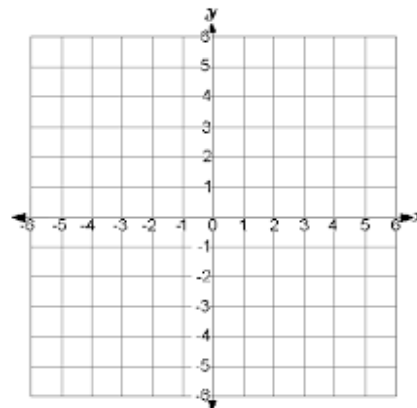
4.  $(-6, 4)$  and  $(1, -2)$



5.  $(4, -5)$  and  $(1, 3)$



6.  $(0, 0)$  and  $(-4, 6)$



Name: \_\_\_\_\_ Date: \_\_\_\_\_ Hour: \_\_\_\_\_

## Geometry – 8.G.9

Write down the formulas for the following:

1) Volume of a Cone =

Find the volume of the following cones with the given dimensions. Round your answer to the nearest hundredth.

2) Radius = 5 cm Height = 8 cm

3) Diameter = 4 ft. Height = 1 foot

4) Diameter = 18 inches Height = 12 inches

5) Radius = 1.5 ft. Height = 0.5 ft.

6) Diameter = 25 mm Height = 19.75 mm

7) Radius = 45 cm Height = 55 cm

Calculate the height of the cone given the following information. Round your answer to the nearest tenth if necessary.

8)  $V = 1,570in^3$  Radius = 10 inches

9)  $V = 3,985 cm^3$  Diameter = 60cm

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Hour: \_\_\_\_\_

## Geometry – 8.G.9

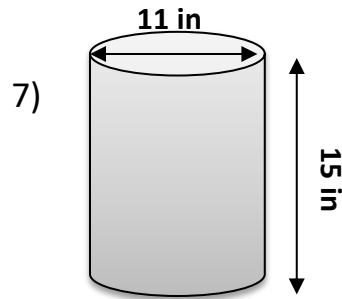
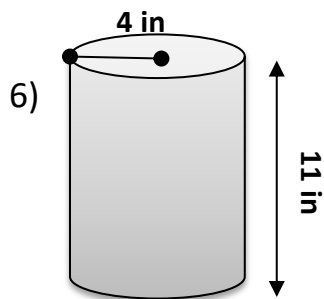
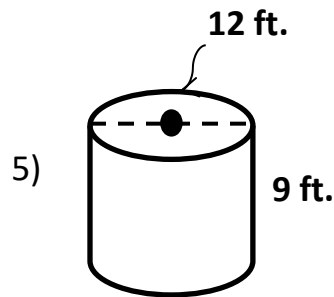
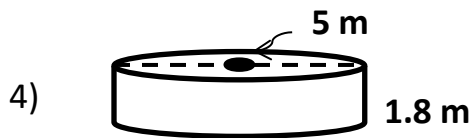
Write down the formulas for the following:

- 1) Volume of a Cylinder

Find the volume of the following cylinders with the given dimensions. Round your answer to the nearest hundredth.

- 2) Radius = 1.5 cm Height = 6 cm

- 3) Diameter = 18 ft. Height = 12 ff.



Calculate the height of the cylinder given the following information. Round your answer to the nearest tenth if necessary.

- 8)  $V = 3,500in^3$  Radius = 20 inches

- 9)  $V = 2,100 ft^3$  Diameter = 15 feet

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Hour: \_\_\_\_\_

## Geometry – 8.G.9

Write down the formulas for the following:

1) Volume of a Sphere

Find the volume of the following sphere with the given dimensions. Round your answer to the nearest hundredth.

2) Radius = 15 in.

3) Diameter = 7 cm.

4) Diameter = 4 ft.

5) Radius = 7.5 ft.

6) Radius = 280 mm

7) Diameter = 45 in.

Calculate the radius of the sphere given the following information. Round your answer to the nearest tenth if necessary.

8)  $V = 5,400in^3$

9)  $V = 8,100 ft^3$

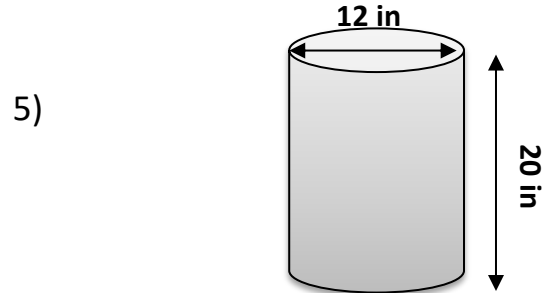
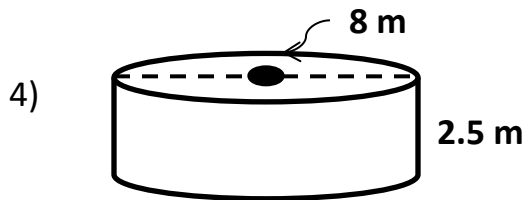
Name: \_\_\_\_\_ Date: \_\_\_\_\_ Hour: \_\_\_\_\_

## Geometry – 8.G.9

Write down the formulas for the following:

- 1) Volume of a Cone =
- 2) Volume of a Cylinder =
- 3) Volume of a Sphere =

Find the volume of the following figures. Round your answer to the nearest hundredth.



6) The radius of the tennis ball is 2 inches.

7) A cone has a diameter of 15 inches and a height of 10 inches.

8) A sphere has a diameter of 29 feet.

9) A ice cream cone has a radius of 7 cm and a height of 8 cm.

Name: \_\_\_\_\_

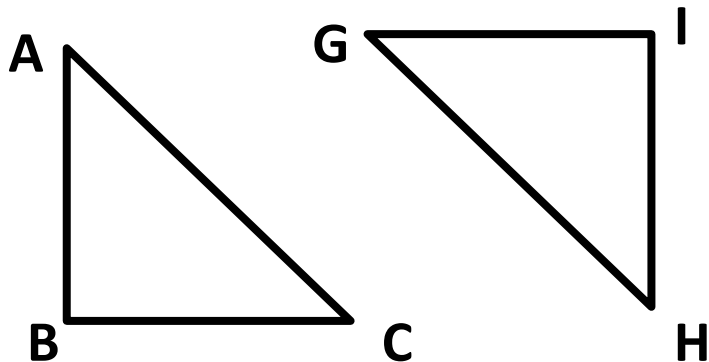
Date: \_\_\_\_\_

Hour: \_\_\_\_\_

## Geometry – 8.G.1

Use patty paper to figure out which sides of the congruent figures are corresponding and which angles are corresponding.

1)



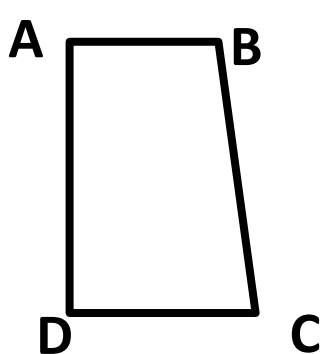
Corresponding Sides:

**A – H****B – I****C – G**

Corresponding Angles:

**A – H****B – I****C – G**

2)



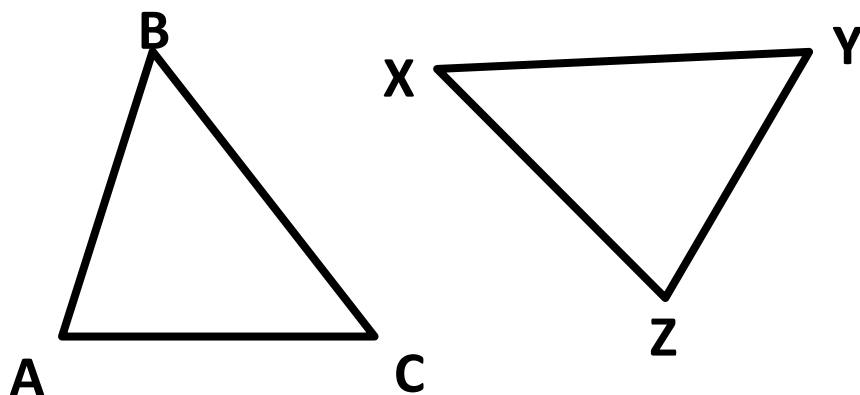
Corresponding Sides:

**A – N****C – P****B – O****D – M**

Corresponding Angles:

**A – N****C – P****B – O****D – M**

3)



Corresponding Sides:

**A – X****C – Z****B – Y**

Corresponding Angles:

**A – X****C – Z****B – Y**

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Hour: \_\_\_\_\_

## Geometry – 8.G.1

Describe in your own words what the following means:

1) Translation –

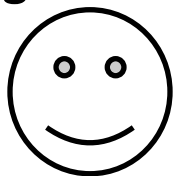
**Answers will vary**

2) Reflection –

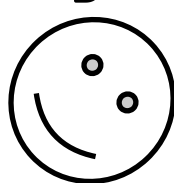
3) Rotation

4) Determine which of the following figures are congruent from only translating figure A

**Figure A**



**B**



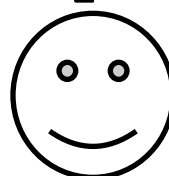
**C**



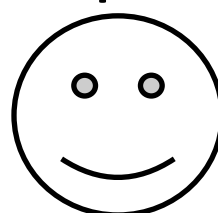
**D**



**E**



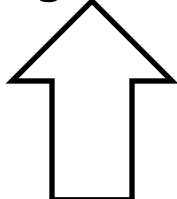
**F**



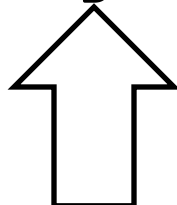
Figure(s): **Figure D and Figure E**

5) .Determine which of the following figures are congruent from only reflecting Figure A.

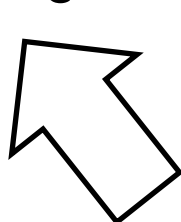
**Figure A**



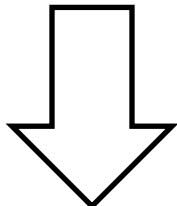
**B**



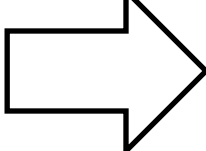
**C**



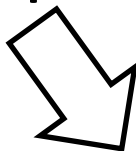
**D**



**E**



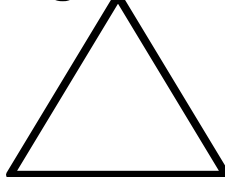
**F**



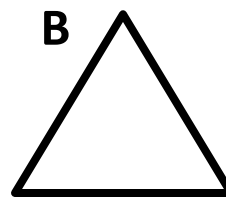
Figure(s): **Figure B, Figure D, and Figure E**

6) .Determine which of the following figures are congruent from only rotating Figure A.

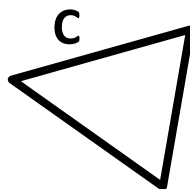
**Figure A**



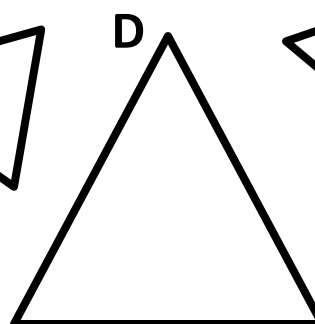
**B**



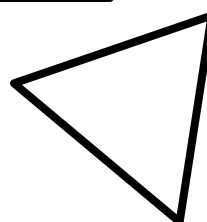
**C**



**D**



**E**



Figure(s): **Figure B and Figure E**



Name: \_\_\_\_\_ Date: \_\_\_\_\_ Hour: \_\_\_\_\_

## Geometry – 8.G.1

**Answer the following questions about a translation:**

1) What stays the same after a translation?

**Size and shape**

2) What changes after a translation?

**Location**

3) What do you need to know in order to perform a translation?

**How far and what direction is the object moving**

4) Draw an example of a translation.

**Examples will vary**

**Answer the following questions about a reflection.**

5) What stays the same after a reflection

**Size and Shape**

6) What changes after a reflection?

**The way the object is facing (usually, unless it looks the same after reflecting) Example of this would be a square or circle.**

7) What do you need to know in order to perform a reflection?

**What is the line of reflection**

8) Draw an example of a reflection.

**Examples will vary**

**Answer the following questions about a rotation.**

9) What stays the same after a rotation?

**Size and Shape**

10) What changes after a rotation?

**The way the object is facing**

11) What do you need to know in order to perform a rotation?

**The degree to which the object is rotating and what direction**

12) Draw an example of a rotation.

**Examples will vary**

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Hour: \_\_\_\_\_

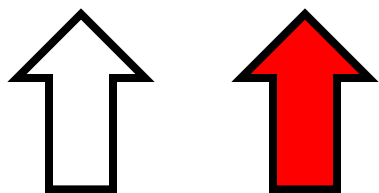
## Geometry – 8.G.2

Determine if the following statements are true or false. If false make the statement true.

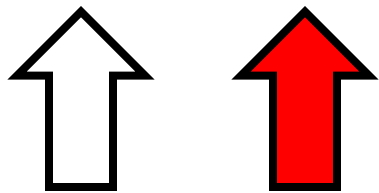
- 1) True A two dimensional figure is congruent to another if it obtained through translations, rotations, or reflections.
- 2) False Translations flip an object.  
**Translations slide an object.**
- 3) False Reflections slide an object.  
**Reflections flip an object.**
- 4) True Rotations turn an object.
- 5) True For a figure to be congruent in must be the same size and shape.
- 6) Explain in your own words what it means for a two dimensional figure to be congruent to another two dimensional figure.

**Answers will vary**

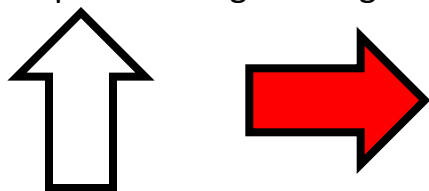
- 7) Give an example of a congruent figure that is obtained by translating the following pre-image to the right.



- 8) Give an example of a congruent figure that is obtained by reflecting the following pre-image across the y – axis.



- 9) Give an example of a congruent figure that is obtained by rotating the following pre-image clockwise.



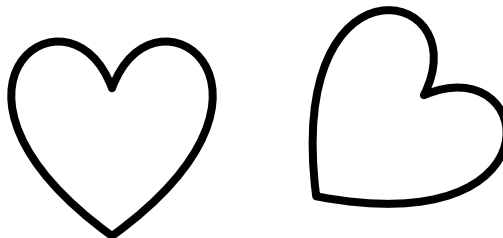
Name: \_\_\_\_\_ Date: \_\_\_\_\_ Hour: \_\_\_\_\_

## Geometry – 8.G.2

The following figures in each of the problems are congruent. Determine the sequence between the two congruent figures. Note the pre-image is always on the left and the image on the right.

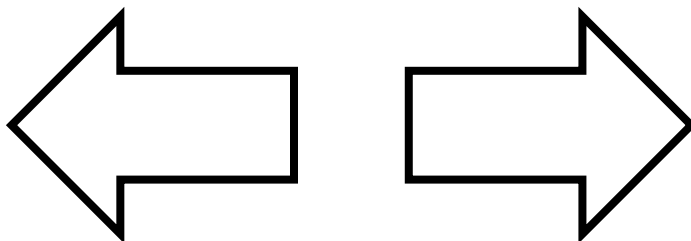
1) **Rotation**

\_\_\_\_\_



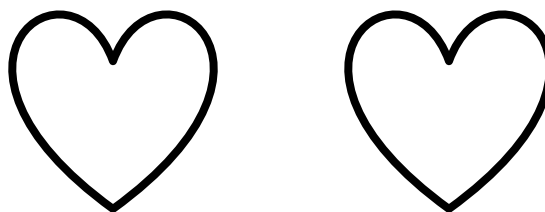
2) **Reflection or Rotation**

\_\_\_\_\_



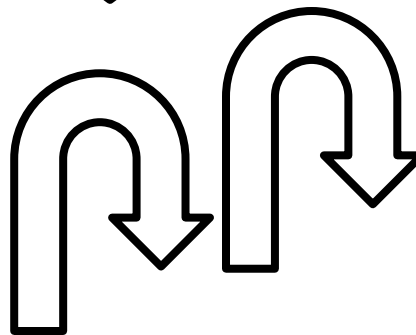
3) **Reflection or Translation**

\_\_\_\_\_



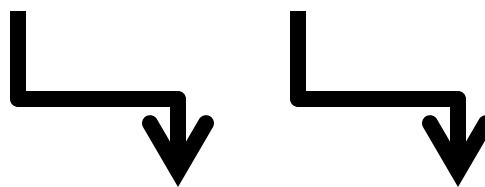
4) **Translation**

\_\_\_\_\_



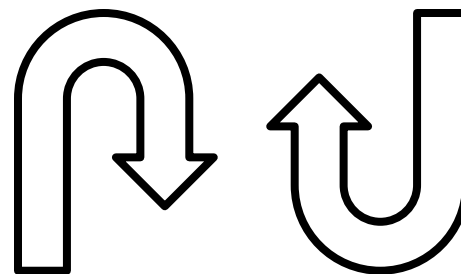
5) **Translation**

\_\_\_\_\_



6) **Rotation**

\_\_\_\_\_



## Geometry – 8.G.3

Match each of the descriptions with the correct representation of the transformation rule.

C 1. Translation 4 left and 3 up

E 2. Rotation 180 degrees

F 3. Reflection over the y-axis

A 4. Reflection over the x-axis

B 5. Translation 4 right and 3 down

D 6. Rotation 90 degrees counter clockwise.

A.  $(x, -y)$

B.  $(x + 4, y - 3)$

C.  $(x - 4, y + 3)$

D.  $(-y, x)$

E.  $(-x, -y)$

F.  $(-x, y)$

Write what the new ordered pairs of the points would be after the given transformation:

7) Find the image of  $(2, 5)$  reflected across the y-axis.

**$(-2, 5)$**

8) Find the image of  $(2, 5)$  translated 3 units right and 2 units up.

**$(5, 7)$**

9) Find the image of  $(2, 5)$  rotated 180 degrees.

**$(-2, -5)$**

10) Find the image of  $(2, 5)$  reflected across the x-axis.

**$(2, -5)$**

11) Find the image of  $(2, 5)$  translated 5 units left and 1 unit up.

**$(-3, 6)$**

12) Find the image of  $(2, 5)$  rotated 90 degrees clockwise.

**$(5, -2)$**

13) Find the image of  $(2, 5)$  dilated by a scale factor of  $\frac{1}{2}$ .

**$(1, 2.5)$**

14) Find the image of  $(2, 5)$  dilated by a scale factor of 4.  **$(8, 20)$**

Name: \_\_\_\_\_

Date: \_\_\_\_\_

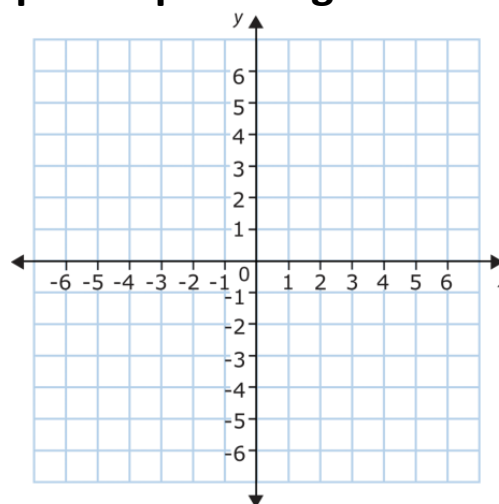
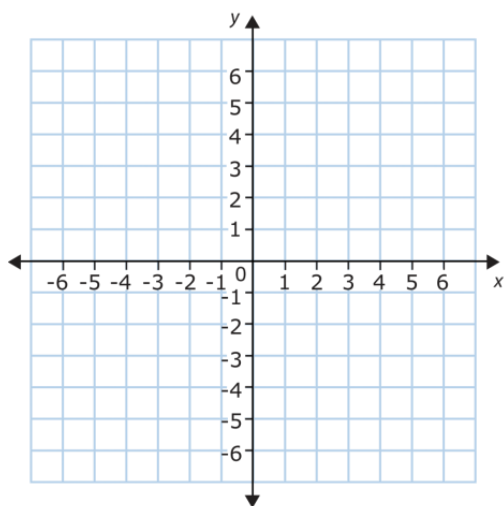
Hour: \_\_\_\_\_

## Geometry – 8.G.3

Use the coordinate plane provided to graph the pre-image and image with the given transformations.

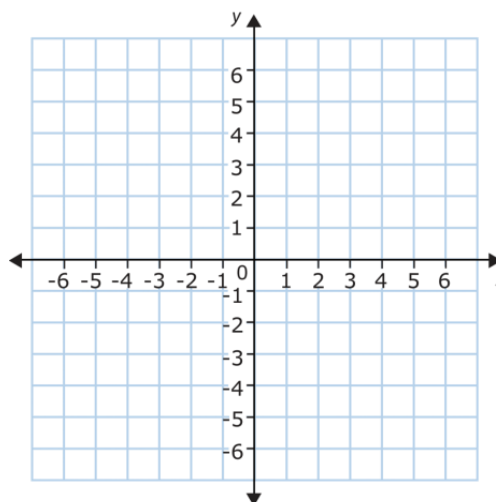
- 1) Translate Triangle ABC with vertices  $A(3, 4)$ ,  $B(5, 1)$  and  $C(3, 1)$  to the left 5 units and down 2 units.

**Check graphs new image should be at:**  
 **$A(-2, 2)$   $B(0, -1)$   $C(-2, -1)$**



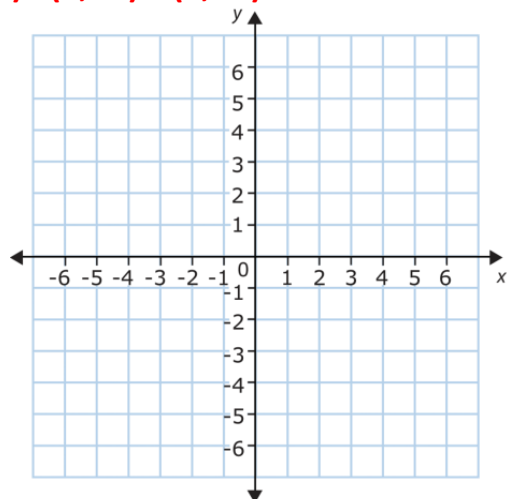
- 2) Rotate Square LMNO with vertices  $L(-2, 1)$ ,  $M(-2, 4)$ ,  $N(-4, 4)$  and  $O(-4, 1)$  90 degrees counterclockwise.

**Check graphs new image should be at:**  
 **$L(-1, 0)$   $M(-4, -2)$   $N(-4, -4)$   $O(-1, -4)$**



- 3) Reflect Triangle EFG with vertices  $E(-2, -2)$ ,  $F(-2, -5)$  and  $G(-5, -3)$  across the y-axis.

**Check graphs new image should be at:**  
 **$E(2, -2)$   $F(2, -5)$   $G(5, -3)$**



- 4) Dilate Square VWXY with vertices  $V(1, -3)$ ,  $W(2, -3)$ ,  $X(1, -2)$  and  $Y(2, -2)$  by a scale factor of 2.

**Check graphs new image should be at:**  
 **$V(2, -6)$   $W(4, -6)$   $X(2, -4)$   $Y(4, -4)$**

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Hour: \_\_\_\_\_

## Geometry – 8.G.4

Determine if the following scale factors would be an enlargement or a reduction.

1. E Scale Factor: 2.5
2. R Scale Factor:  $\frac{3}{4}$
3. R Scale Factor: 0.1
4. E Scale Factor  $\frac{8}{3}$
5. E Scale Factor: 5
6. Explain in your own words how you know if the figure will be an enlargement or a reduction when dilating.

**Answers will vary**

7. Explain in your own words what it means for two figures to be similar.

**Answers will vary**

8. Graph a rectangle by graphing points A(1, 1), B (4, 1), C(4, 4), and D (1, 4).

**Check students graphs**

- A. Dilate the figure with respect to the origin by a scale factor of 2. Label the new coordinates:

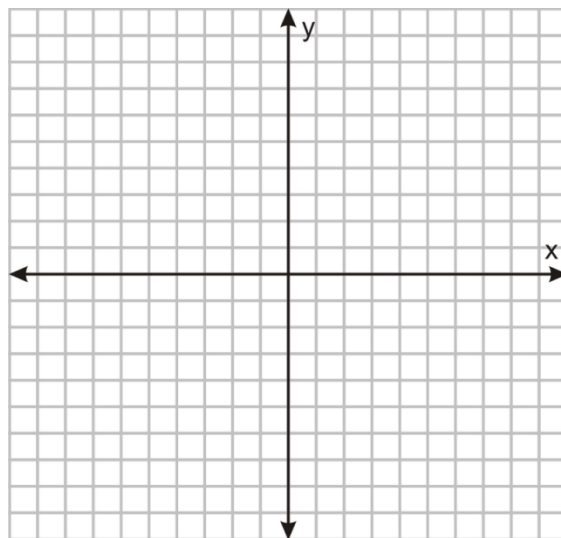
A (2, 2) B (8, 2) C (8, 8) D (2, 8)

- B. Reflect the image across the y axis and record the new coordinates:

A (-2, 2) B (-8, 2) C (-8, 8) D (-2, 8)

- C. Translate the figure down 12 units and right 5 units. Record the new coordinates:

A (3, -10) B (-3, -10) C (-3, -4) D (3, -4)



## Geometry – 8.G.4

1. Graph a rectangle by graphing points A(1, 1), B (4, 1), C(4, 4), and D (1, 4).

**Check students graph**

A. Reflect the image across the x axis and record the new coordinates:

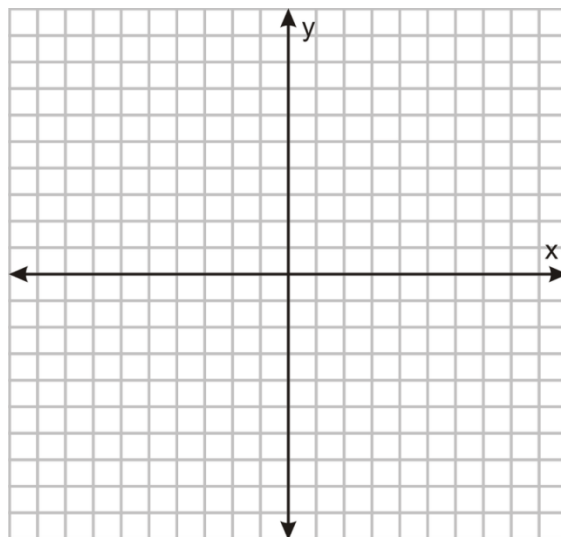
A (1, -1) B (4, -1) C (4, -4) D (1, -4)

B. Rotate the image 180 degrees and record the new coordinates:

A (-1, 1) B (-4, 1) C (-4, 4) D (-1, 4)

C. Translate the figure up 4 units and right 6 units. Record the new coordinates:

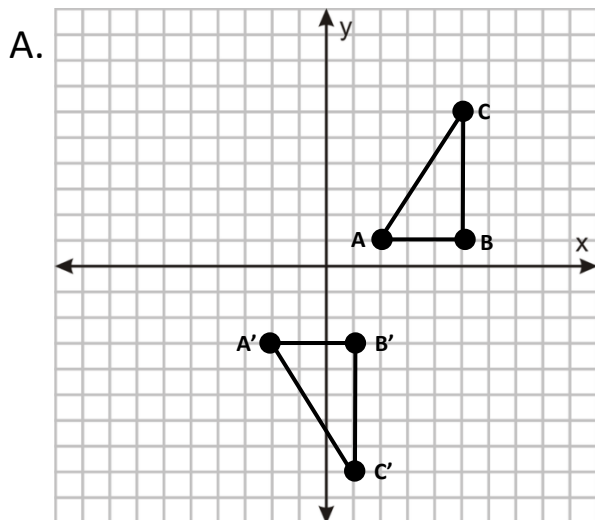
A (5, 5) B (2, 5) C (2, 8) D (5, 8)



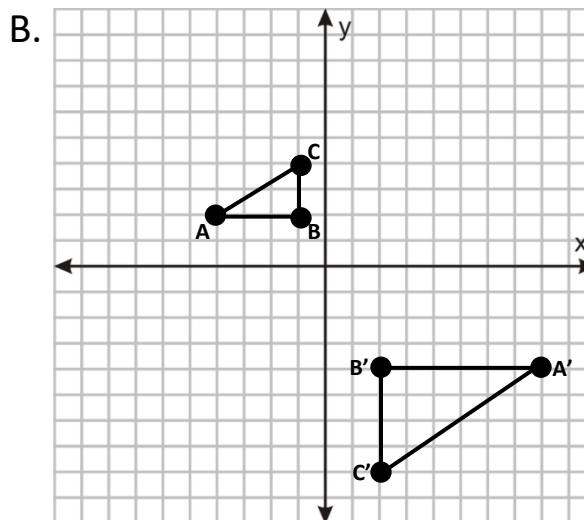
D. Is this figure similar to the original rectangle you graphed? Explain.

**Yes, similar, reasons will vary.**

2. The following figures are similar. Describe a sequence that shows the similarity between them.



**Reflection across the y – axis and then translation left 4 units and down 2 units.**

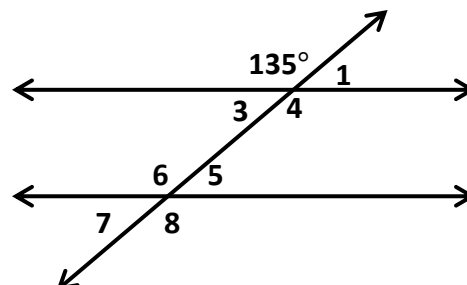


**Dilation by a scale factor of 2 and then rotation 180°**

## Geometry – 8.G.5

Determine if the following statements are true or false using the diagram.

- 1) **True** Angles 5 and 7 are vertical angles.
- 2) **True** The value of angle 6 is  $135^\circ$
- 3) **False** The value of angle 1 is  $35^\circ$ .
- 4) **False** Angles 3 and 6 are alternate interior angles.
- 5) **False** Angles 1 and 8 are corresponding angles.



- 6) Find the measure of all 7 angles given that one of the angles is  $115^\circ$ .

Angle 1 =  **$65^\circ$**

Angle 5 =  **$65^\circ$**

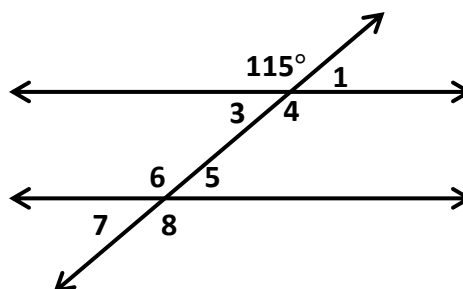
Angle 2 =  **$115^\circ$**

Angle 6 =  **$115^\circ$**

Angle 3 =  **$65^\circ$**

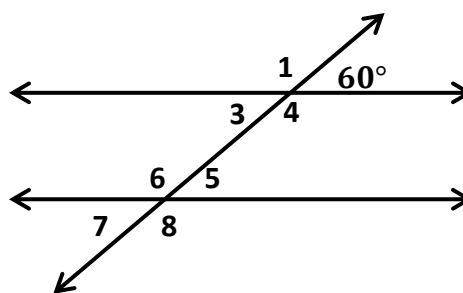
Angle 7 =  **$65^\circ$**

Angle 4 =  **$115^\circ$**



Determine if the following statements are true or false using the diagram.

- 7) **True** Angles 3 and 4 are supplementary angles
- 8) **True** Angle 7 is  $60^\circ$ .
- 9) **False** Angle 3 and angle 6 are corresponding angles.
- 10) **False** Angles 5 and 8 are complementary angles.
- 11) **True** Angles 1 and 4 are vertical angles.
- 12) **True** Angles 4 and 5 are supplementary angles.



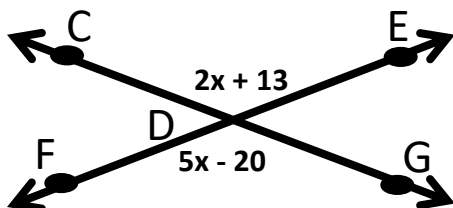


## Geometry – 8.G.5

Answer the following questions. SHOW ALL OF YOUR WORK!

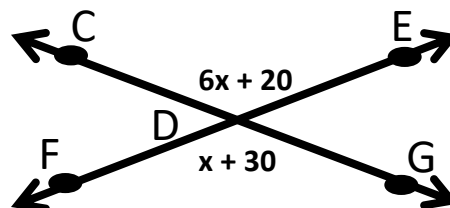
Note: The images are not drawn to scale.

- 1) Find the  $m\angle FDG$



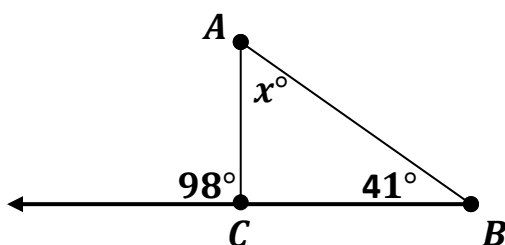
$$35^\circ$$

- 2) Find the  $m\angle EDG$



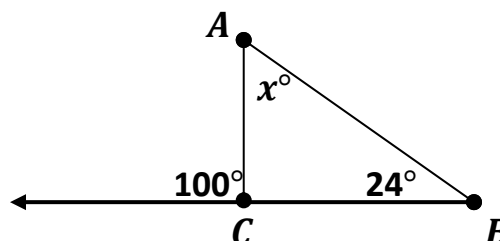
$$146^\circ$$

- 3) Find the unknown angle measure.



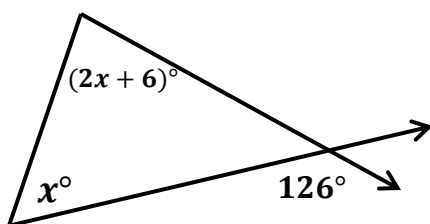
$$57^\circ$$

- 4) Find the unknown angle measure.



$$76^\circ$$

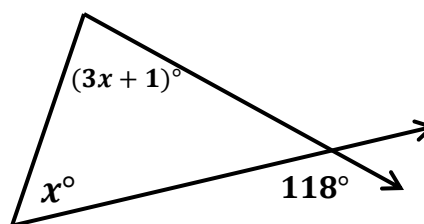
- 5) Write an equation and solve for x.



$$2x + 6 + x + 54 = 180$$

$$x = 40$$

- 6) Write an equation and solve for x.



$$3x + 1 + x + 62 = 180$$

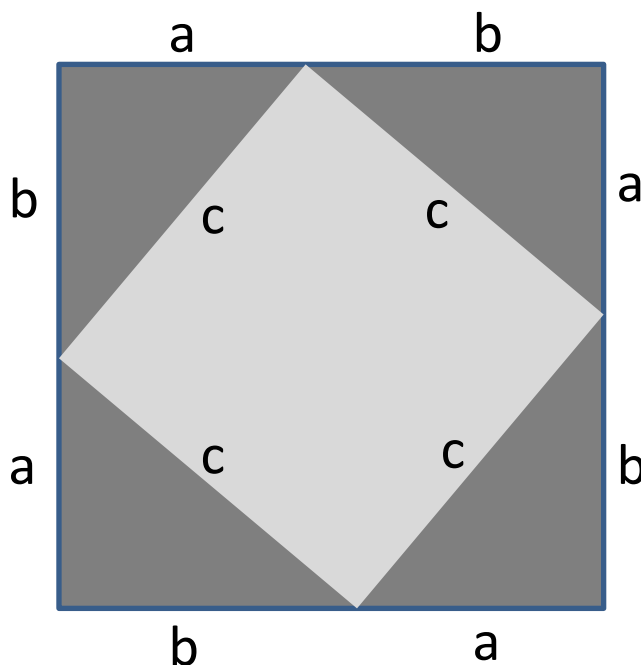
$$x = 29.25$$

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Hour: \_\_\_\_\_

## Geometry – 8.G.6

Fill in the blanks on the following problems to show a proof of the Pythagorean Theorem using Algebra.

Using this diagram will help you, it has four “abc” triangles in it.



1) Area of the Whole Square

It is a big square, with each side having a length of  $a + b$ , so the total area of the whole square is

$$A = \underline{(a + b)(a + b)}$$

2) Area of the smaller (titled) square:

$$A = \underline{(c)(c) \text{ or } c^2}$$

3) Area of one triangle:

$$A = \underline{\frac{1}{2}ab}$$

4) Area of all four triangles:

$$A = \underline{4\left(\frac{1}{2}ab\right) \text{ or } 2ab}$$

5) Sum of the titled square and the 4 triangles:

$$A = \underline{c^2 + 2ab}$$

6) The area of the large square is equal to the area of the titled square and the 4 triangles. Take your two expressions and set them equal to each other. For example

Area of Large Square (Question 1) = Area of Titled Square + Triangle (Question 5)

$$\underline{(a + b)(a + b)} = \underline{c^2 + 2ab}$$

7) When you expand  $(a + b)(a + b)$  it equals  $a^2 + 2ab + b^2$ . Subtract  $2ab$  from both sides and see what you get!

$$a^2 + b^2 = c^2$$

**THE PYTHAGOREAN THEOREM**

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Hour: \_\_\_\_\_

## Geometry – 8.G.6

1) What is the Pythagorean Theorem:  $a^2 + b^2 = c^2$

2) a and b are referred to as : *legs*

3) C is referred to as the: *hypotenuse*

Determine what type of triangle is formed by each set of numbers

4) 3, 4, 5

*right*

5) 9, 9, 13

*obtuse*

6) 11, 11, 15

*obtuse*

7) 7, 7, 7

*acute*

8) 6, 8, 10

*right*

9) 8, 10, 12

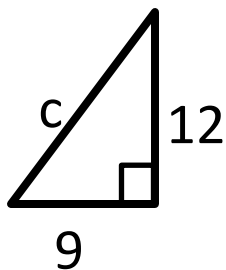
*acute*

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Hour: \_\_\_\_\_

## Geometry – 8.G.7

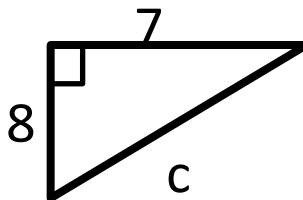
Find the length of the missing side to the nearest tenth.

1.



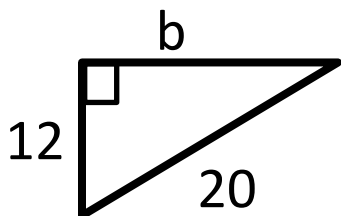
15

2.



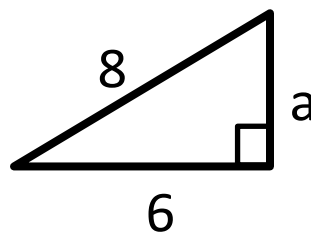
10.63

3.



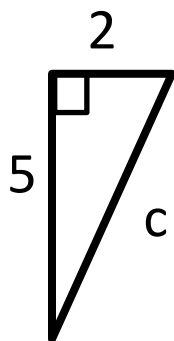
16

4.



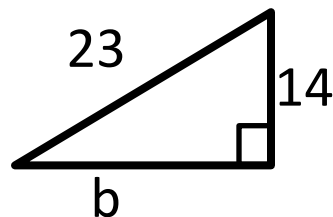
5.29

5.



5.38

6.



18.25

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Hour: \_\_\_\_\_

## Geometry – 8.G.7

**Solve the following word problems – Show all your work!**

1. A baseball diamond is a square with sides of 90 feet. What is the distance, to the nearest tenth of a foot, between home and second base?

**127.28 feet**

2. Two joggers run 9 miles north and then 3 miles west. What is the shortest distance, to the nearest tenth of a mile, they must travel to return to their starting point?

**9.49 miles**

3. A soccer field is a rectangle 90 meters wide and 120 meters long. The coach asks players to run from one corner to the corner diagonally across. What is the distance to the nearest tenth of a meter?

**150 meters**

4. Amy leaves the house to go get ice cream. She walks 2 miles west and 3 miles north. How far away is Amy from her starting point?

**3.61 miles**

5. Mr. Smith tells you that a right triangle has a hypotenuse of 19 and a leg of 10. He asks you to find the other leg of the triangle. What is your answer?

**16.16 units**

6. A cat is stuck on the roof. If the ladder is 12 feet long and must be placed seven feet away from the building. How high can the ladder reach up the building to help save the cat?

**13.89 feet**

7. Blake made a rectangular table for his dining room. The sides of the table are 12 feet and 4 feet. What is the length of the diagonal of the table?

**12.65 feet**

8. A fire truck parks 16 feet away from a building. The fire truck extends its ladder 30 feet to the very top of the building. How tall is the building?

**25.38 feet**

Name: \_\_\_\_\_

Date: \_\_\_\_\_

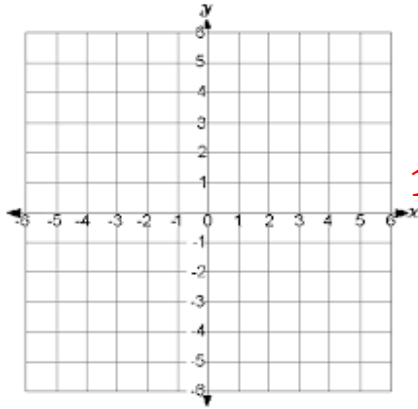
Hour: \_\_\_\_\_

## Geometry – 8.G.8

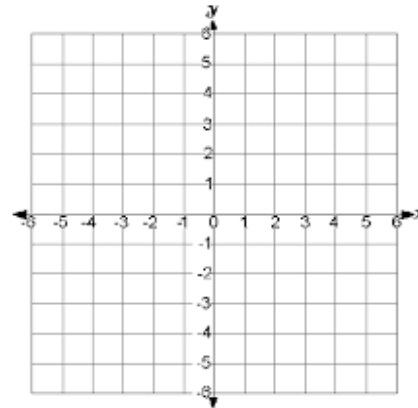
Find the distance between the following points:

1.  $(-6, 4)$  and  $(5, 1)$

2.  $(-2, 6)$  and  $(-2, -2)$



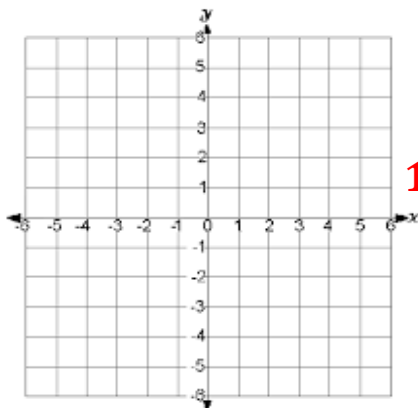
**11.7 units**



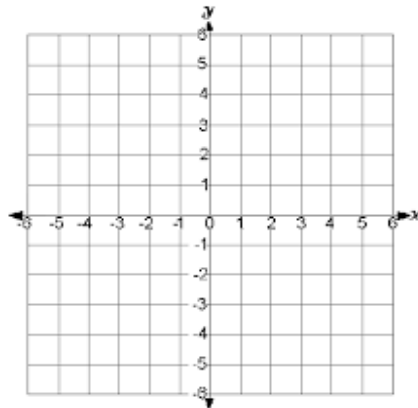
**8 units**

3.  $(7, 0)$  and  $(-5, -6)$

4.  $(-4, 0)$  and  $(8, -3)$



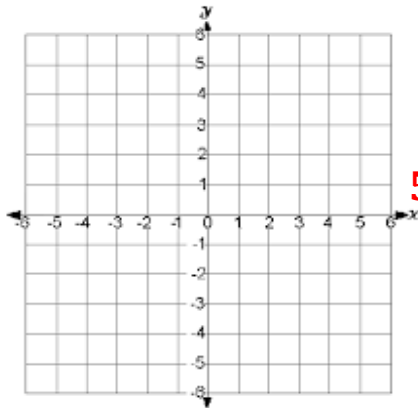
**13.42 units**



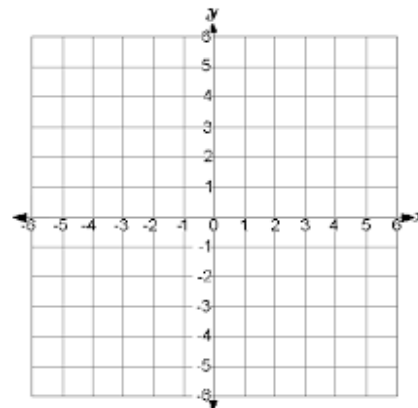
**12.37 units**

5.  $(6, 4)$  and  $(1, 1)$

6.  $(-5, -2)$  and  $(0, 3)$



**5.83 units**

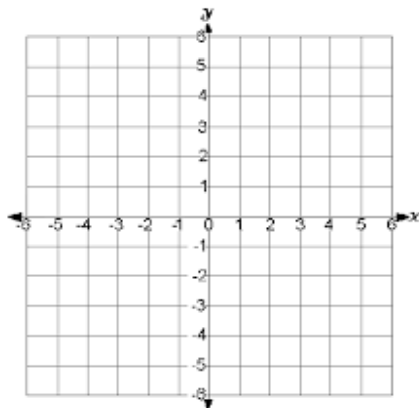


**7.07 units**

## Geometry – 8.G.8

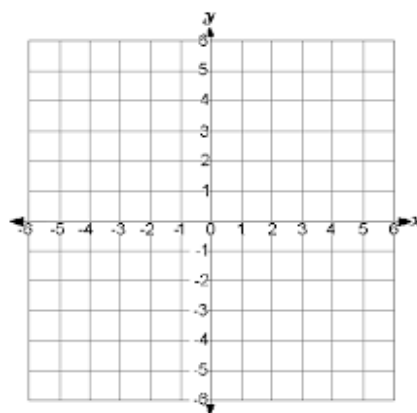
Find the distance between the following points:

1.  $(-1, -4)$  and  $(3, -1)$



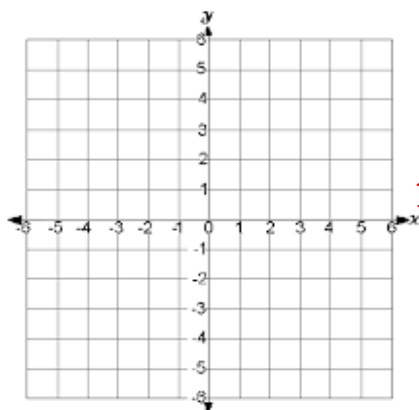
**5 units**

2.  $(0, 6)$  and  $(5, 0)$



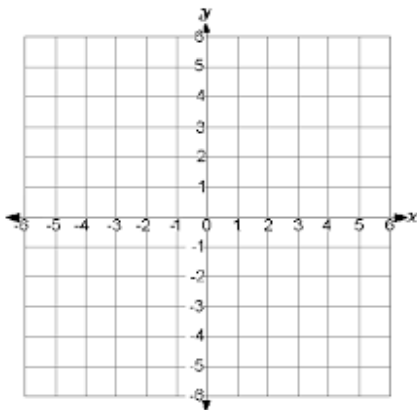
**7.81 units**

3.  $(4, 5)$  and  $(-3, -3)$



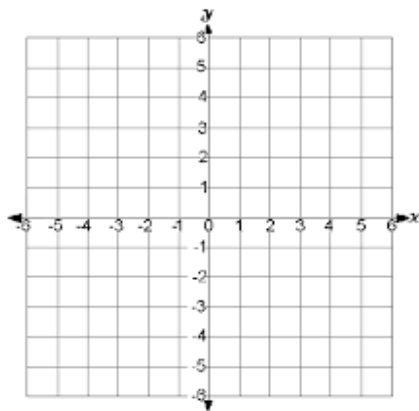
**10.63 units**

4.  $(-6, 4)$  and  $(1, -2)$



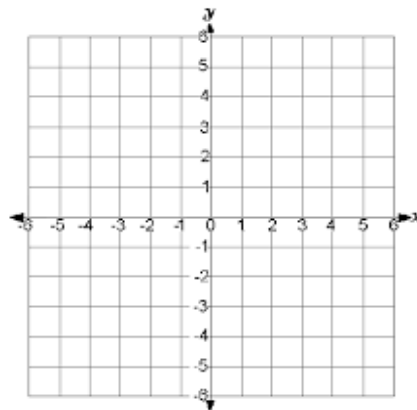
**10.63 units**

5.  $(4, -5)$  and  $(1, 3)$



**8.54 units**

6.  $(0, 0)$  and  $(-4, 6)$



**8.94 units**

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Hour: \_\_\_\_\_

## Geometry – 8.G.9

Write down the formulas for the following:

1) Volume of a Cone =  $V = \frac{\pi r^2 h}{3}$

Find the volume of the following cones with the given dimensions. Round your answer to the nearest hundredth.

2) Radius = 5 cm Height = 8 cm

$$V = 209.33 \text{ cm}^3$$

3) Diameter = 4 ft. Height = 1 foot

$$V = 4.19 \text{ ft}^3$$

4) Diameter = 18 inches Height = 12 inches

$$V = 1,017.36 \text{ in}^3$$

5) Radius = 1.5 ft. Height = 0.5 ft.

$$V = 1.18 \text{ ft}^3$$

6) Diameter = 25 mm Height = 19.75 mm

$$V = 3,229.95 \text{ mm}^3$$

7) Radius = 45 cm Height = 55 cm

$$V = 116,572.5 \text{ cm}^3$$

Calculate the height of the cone given the following information. Round your answer to the nearest tenth if necessary.

8)  $V = 1,570 \text{ in}^3$  Radius = 10 inches

$$h = 15 \text{ inches}$$

9)  $V = 3,985 \text{ cm}^3$  Diameter = 60cm

$$h = 38.1 \text{ cm}$$



Name: \_\_\_\_\_ Date: \_\_\_\_\_ Hour: \_\_\_\_\_

## Geometry – 8.G.9

Write down the formulas for the following:

- 1) Volume of a Cylinder  $V = \pi r^2 h$

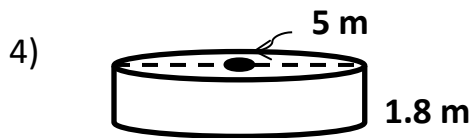
Find the volume of the following cylinders with the given dimensions:

- 2) Radius = 1.5 cm Height = 6 cm

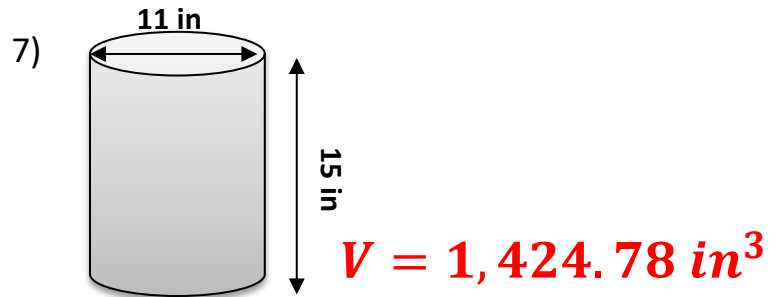
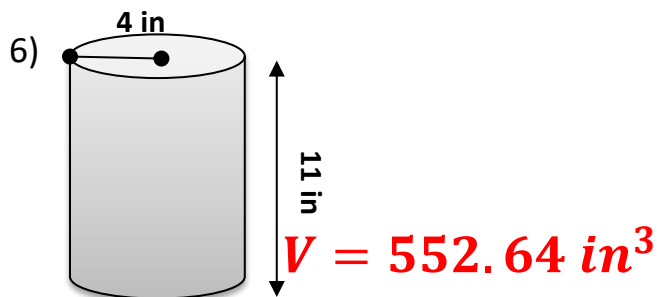
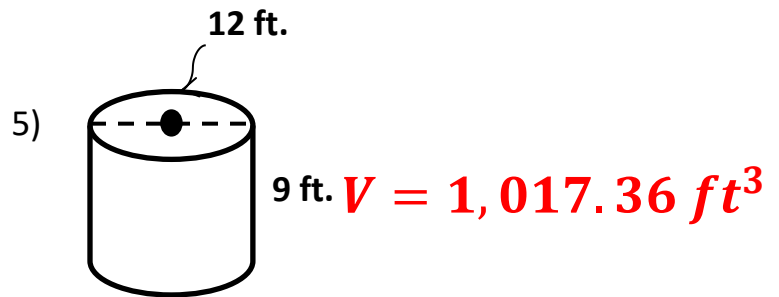
$$V = 42.39 \text{ cm}^3$$

- 3) Diameter = 18 ft. Height = 12 ff.

$$V = 3,052.08 \text{ ft}^3$$



$$V = 35.33 \text{ m}^3$$



Calculate the height of the cylinder given the following information. Round your answer to the nearest tenth if necessary.

- 8)  $V = 3,500 \text{ in}^3$  Radius = 20 inches

$$h = 2.8 \text{ inches}$$

- 9)  $V = 2,100 \text{ ft}^3$  Diameter = 15 feet

$$h = 11.9 \text{ feet}$$

Name: \_\_\_\_\_ Date: \_\_\_\_\_ Hour: \_\_\_\_\_

## Geometry – 8.G.9

Write down the formulas for the following:

1) Volume of a Sphere  $V = \frac{4}{3}\pi r^3$

Find the volume of the following sphere with the given dimensions:

2) Radius = 15 in.

$$V = 14,130 \text{ in}^3$$

3) Diameter = 7 cm.

$$V = 179.5 \text{ cm}^3$$

4) Diameter = 4 ft.

$$V = 33.49 \text{ ft}^3$$

5) Radius = 7.5 ft.

$$V = 1,766.25 \text{ ft}^3$$

6) Radius = 280 mm

$$V = 91,905,706.67 \text{ mm}^3$$

7) Diameter = 45 in.

$$V = 47,688.75 \text{ in}^3$$

Calculate the radius of the sphere given the following information. Round your answer to the nearest tenth if necessary.

8)  $V = 5,400 \text{ in}^3$

$$r = 10.9 \text{ inches}$$

9)  $V = 8,100 \text{ ft}^3$

$$r = 12.5 \text{ feet}$$

## Geometry – 8.G.9

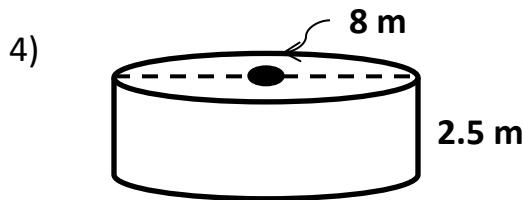
Write down the formulas for the following:

1) Volume of a Cone =  $V = \frac{\pi r^2 h}{3}$

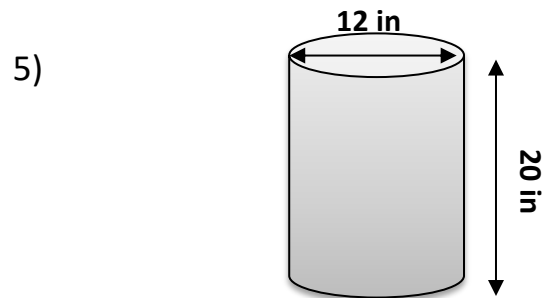
2) Volume of a Cylinder =  $V = \pi r^2 h$

3) Volume of a Sphere =  $V = \frac{4}{3} \pi r^3$

Find the volume of the following figures:



$$V = 126.6m^3$$



$$V = 2,260.8 in^3$$

6) The radius of the tennis ball is 2 inches.

$$V = 33.49 in^3$$

7) A cone has a diameter of 15 inches and a height of 10 inches.

$$V = 588.75 in^3$$

8) A sphere has a diameter of 29 feet.

$$V = 12,763.58 ft^3$$

9) A ice cream cone has a radius of 7 cm and a height of 8 cm.

$$V = 410.29 cm^3$$

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~Math in the Midwest

