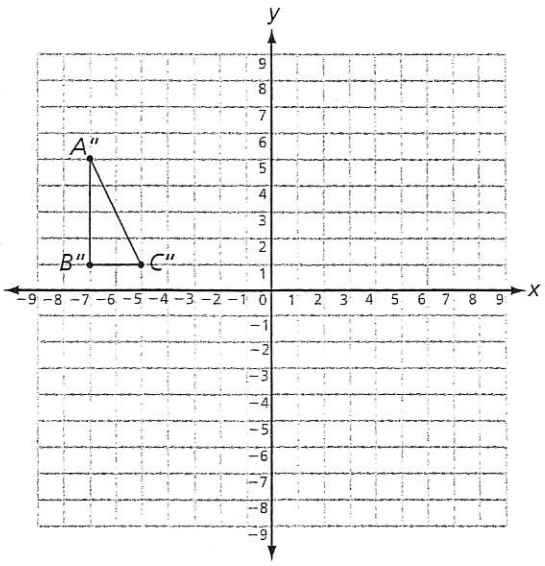
Open-Ended Practice

Some tests include questions in which you must explain how you solved a problem. You may also be asked to show your work, draw graphs, or make diagrams. The example below will give you practice responding to such questions.

25 On the coordinate grid below, ΔABC was reflected across the x-axis to get the image $\Delta A'B'C'$. Then $\Delta A'B'C'$ was translated left 8 units to get the image $\Delta A''B''C''$.



Draw and label $\Delta A'B'C'$ and ΔABC on the coordinate grid above.

What are the coordinates of the vertices of ΔABC?

vertex *A*: _____

vertex *B*: _____

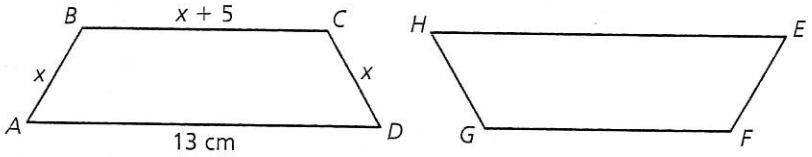
vertex *C*: _____

Number Correct/Total = _____/25

Name _____ Date _____

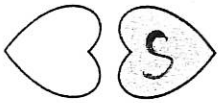
Chapter 2 – Review

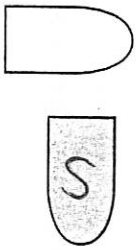
Trapezoids *ABCD* and *EFGH* are congruent.

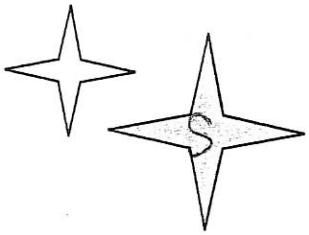


1. Which side of *EFGH* is congruent to side *AD*?
2. The perimeter of *ABCD* is 30 centimeters. What is the value of x?
3. What is the length of side *EF*?
4. What is the length of side *GF*?

Tell whether the shaded figure is a *translation, reflection, rotation,* or *dilation* of the nonshaded figure.

5. 

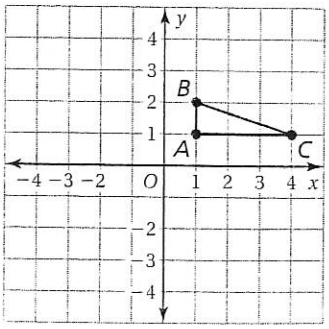
6. 

7. 

8. 

9. The vertices of a triangle are $X(-6, -9)$, $Y(-3, -9)$, and $Z(-3, -3)$. Dilate the triangle with respect to the origin using a scale factor of $\frac{1}{3}$. Then reflect the triangle in the x-axis. What are the coordinates of the image?

10. Rotate the triangle 180° about the origin, and then translate the triangle 3 units right and 2 units up. Find the coordinates of the image.



Answers

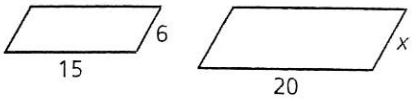
1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. See left.

Name _____ Date _____

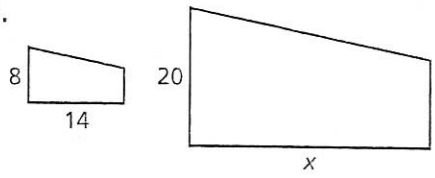
Chapter 2 (continued)

The polygons are similar. Find *x*.

11.



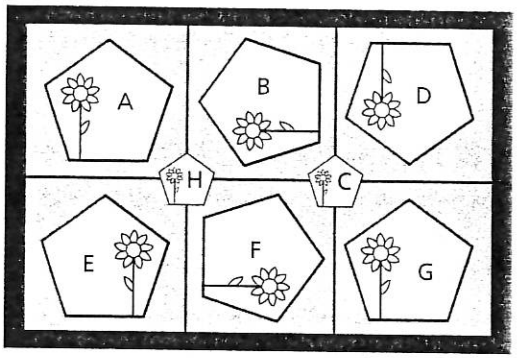
12.



Rectangle *ABCD* is similar to Rectangle *WXYZ*. Tell whether the statement is *true* or *false*.

13. $\frac{\text{Perimeter of } ABCD}{\text{Perimeter of } WXYZ} = \left(\frac{CD}{YZ}\right)^2$ **14.** $\frac{\text{Area of } ABCD}{\text{Area of } WXYZ} = \left(\frac{CD}{YZ}\right)^2$

15. Several transformations are used to create the quilt.



a. Describe the transformation of Design A to Design B.

b. Describe the transformation of Design E to Design G.

c. Describe the transformation of Design A to Design H.

d. Which two designs represent a translation?

e. From Design A, which design is a reflection and a 90° clockwise rotation about the origin?

16. Explain how you know if a dilation is an enlargement or a reduction.

17. A scale on a drawing is 0.5 mm : 4 cm. The height of the drawing is 4.5 millimeters. What is the actual height of the object?

Answers

11. _____

_____

12. _____

_____

13. _____

14. _____

15. a. _____

b. _____

c. _____

d. _____

e. _____

16. _____

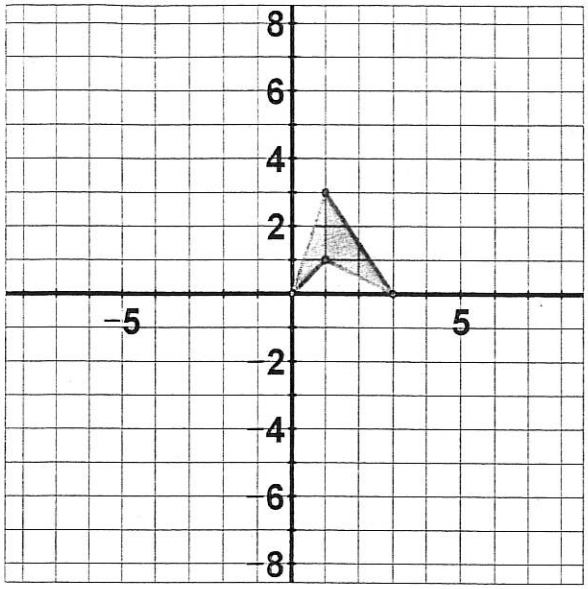
_____

_____

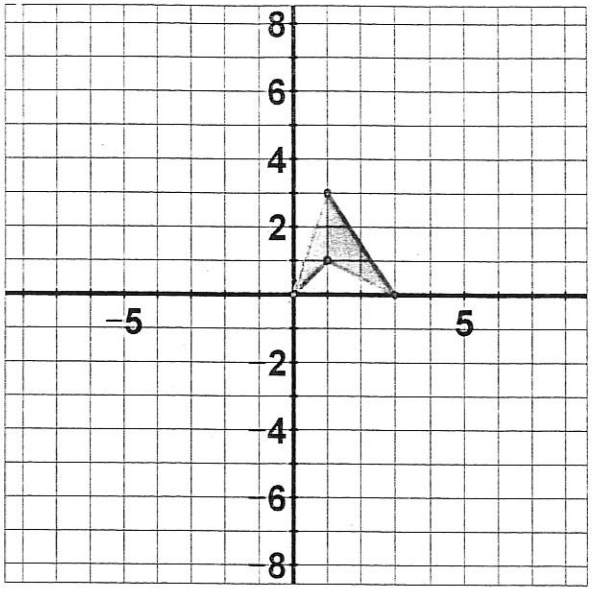
17. _____

Apply the given transformation to the given pre-image. *(5 pts; no partial credit)*

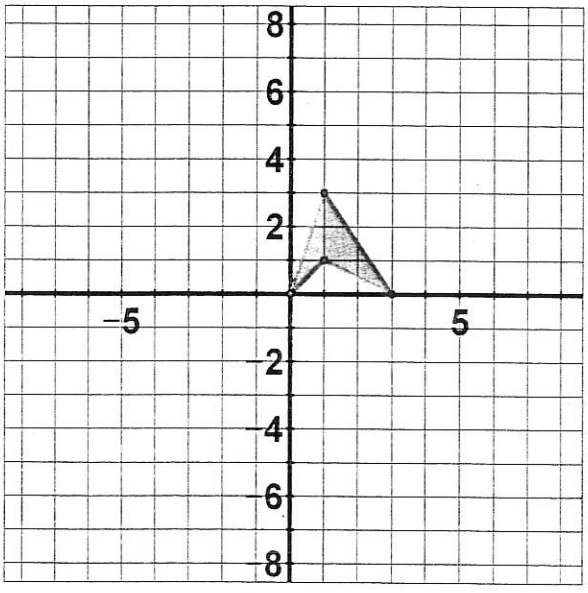
18. Translation by vector $\begin{pmatrix} 2 \\ 5 \end{pmatrix}$



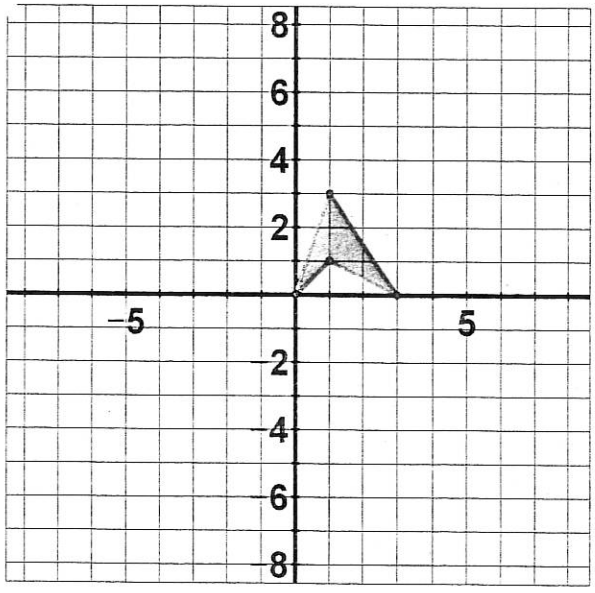
19. Rotation by 90°



20. Reflection across the y-axis



21. Dilation by scale factor 2

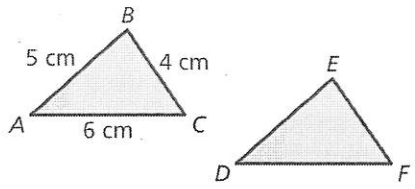


2 Chapter Test

Check It Out
Test Practice
BigIdeasMath.com

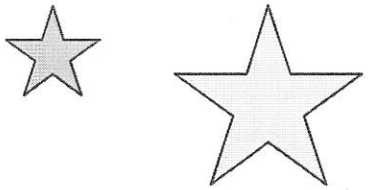
Triangles *ABC* and *DEF* are congruent.

1. Which angle of *DEF* corresponds to $\angle C$?
2. What is the perimeter of *DEF*?

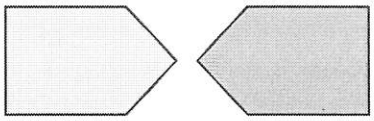


Tell whether the blue figure is a *translation*, *reflection*, *rotation*, or *dilation* of the red figure.

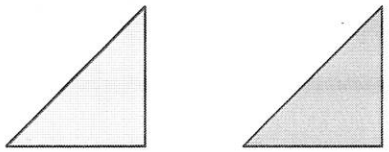
3.



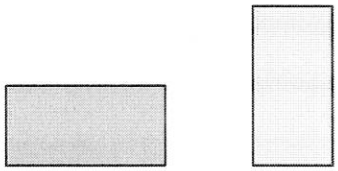
4.



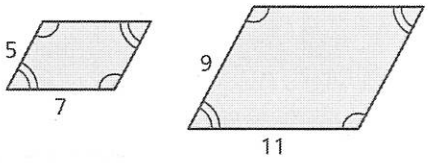
5.



6.

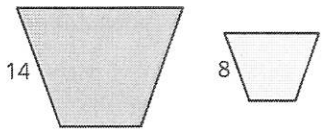


7. The vertices of a triangle are $A(2, 5)$, $B(1, 2)$, and $C(3, 1)$. Reflect the triangle in the x-axis, and then rotate the triangle 90° counterclockwise about the origin. What are the coordinates of the image?
8. The vertices of a triangle are $A(2, 4)$, $B(2, 1)$, and $C(5, 1)$. Dilate the triangle with respect to the origin using a scale factor of 2. Then translate the triangle 2 units left and 1 unit up. What are the coordinates of the image?
9. Tell whether the parallelograms are similar. Explain your reasoning.

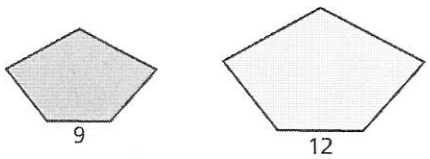


The two figures are similar. Find the ratios (red to blue) of the perimeters and of the areas.

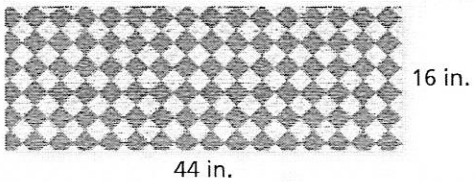
10.



11.



12. **SCREENS** A wide-screen television measures 36 inches by 54 inches. A movie theater screen measures 42 feet by 63 feet. Are the screens similar? Explain.
13. **CURTAINS** You want to use the rectangular piece of fabric shown to make a set of curtains for your window. Name the types of congruent shapes you can make with one straight cut. Draw an example of each type.



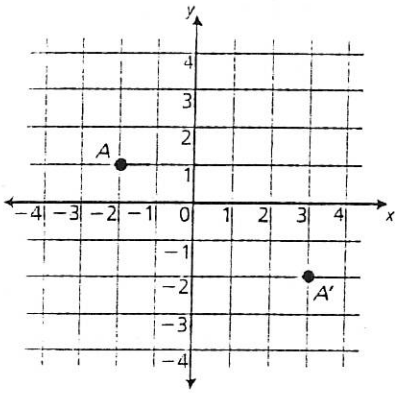
MATH Unit 6

Geometry

ctions: Read and answer each question.

Translations

Which describes the movement from A to A' ?



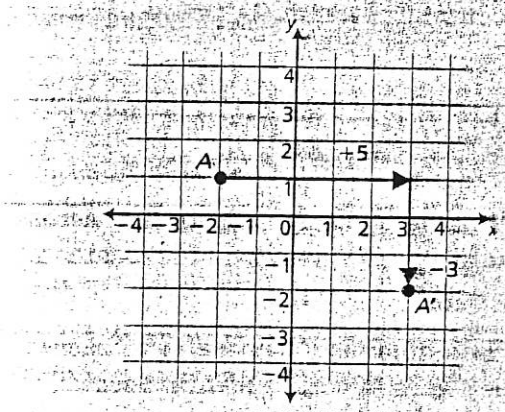
Ⓐ $(x, y) \rightarrow (x + 5, y - 3)$
Ⓑ $(x, y) \rightarrow (x - 3, y - 5)$
Ⓒ $(x, y) \rightarrow (x + 5, y + 3)$
Ⓓ $(x, y) \rightarrow (x + 3, y - 2)$

Translations

In a **translation**, a figure moves in a straight line. The figure can move left or right, up or down, or in a combination of those directions.

Step-By-Step

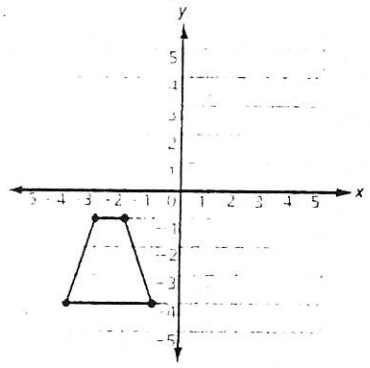
In **example 1**, the movement from A to A' is described by the change in the values of the x- and y-coordinates.



1. Find the change in the x- and y-values between A and A'.
2. Choose the answer that describes increasing the x-value by 5 and decreasing the y-value by 3.

GO ON

2 Suppose the trapezoid shown below is reflected over the x-axis. What are the coordinates of the vertices of the reflected figure?



Ⓐ $(-2, 1), (-3, 1), (-4, 4), (-1, 4)$

Ⓑ $(-3, 1), (3, -1), (-4, 4), (-1, 4)$

Ⓒ $(2, -1), (-3, 1), (-4, 4), (1, -4)$

Ⓓ $(-2, -1), (-3, 1), (-4, 4), (-1, -4)$

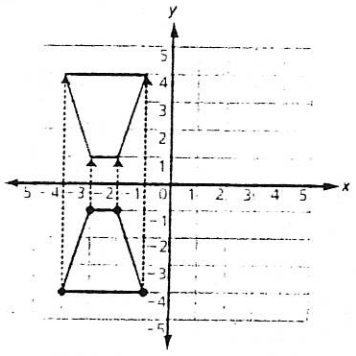
Reflections

When a point (x, y) is reflected across the x-axis, the new point is located at $(x, -y)$.

When a point (x, y) is reflected across the y-axis, the new point is located at $(-x, y)$.

Think It Through

In **example 2**, the x-axis acts like a mirror. The trapezoid will appear to be flipped upward. Each point is the same distance from the x-axis in the reflection as it was in the original shape.



For each reflected point, the x-value is the same as the original x-value; the y-value is the opposite of the original y-value.

$(-2, -1) \rightarrow (-2, 1)$

$(-3, -1) \rightarrow (-3, 1)$

$(-4, -4) \rightarrow (-4, 4)$

$(-1, -4) \rightarrow (-1, 4)$

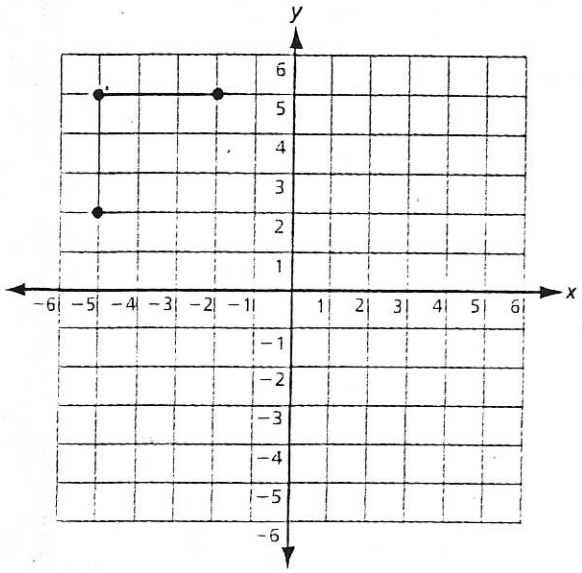
Properties of Translations, Reflections, and Rotations

Translations, reflections, and rotations can change the position and orientation of a figure. But the size and shape do not change. Here are three properties of these transformations.

- Lines are taken to lines, and line segments to line segments of the same length.
- Angles are taken to angles of the same measure.
- Parallel lines are taken to parallel lines.

Try It

Questions 1–4: Use this graph to answer the questions.



1 Joan needs to plot one more point to complete the square. Which ordered pair describes this point?

Ⓐ $(-2, 2)$ Ⓒ $(-5, 0)$
Ⓑ $(-2, 0)$ Ⓓ $(2, 5)$

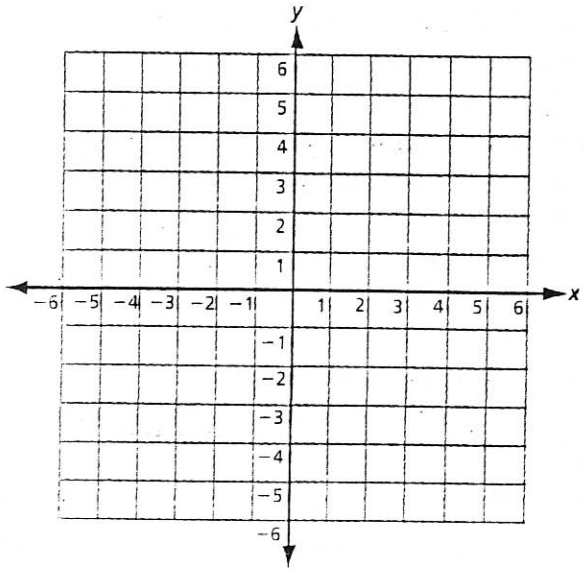
2 Find the area of the square.

Ⓐ 3 units^2 Ⓒ 12 units^2
Ⓑ 9 units^2 Ⓓ 18 units^2

3 Translate the square by moving it 6 units to the right and 4 units down.

4 Draw a reflection of the square you drew in question 3. Reflect the shape over the *y*-axis.

Questions 5–7: Use this graph to answer the questions.



5 Plot the points below and connect the points to form a triangle. Which shows the length of an altitude of the triangle?

$(2, 4), (2, -3), (-4, -3)$

Ⓐ 1 unit Ⓒ 5 units
Ⓑ 4 units Ⓓ 7 units

6 Find the area of the triangle you drew in question 5.

Ⓐ 3 units^2 Ⓒ 21 units^2
Ⓑ 9 units^2 Ⓓ 42 units^2

7 If you translate the triangle 3 units up and 5 units to the left, will the area of the triangle change? Explain your answer.

Answer: _____

_____

_____

GO ON

8 You want to translate a point up and to the left. What is the procedure for doing that?

Ⓐ Add a positive number to its x-coordinate and a positive number to the y.

Ⓑ Add a positive number to its x-coordinate and a negative number to the y.

Ⓒ Add a negative number to its x-coordinate and a positive number to the y.

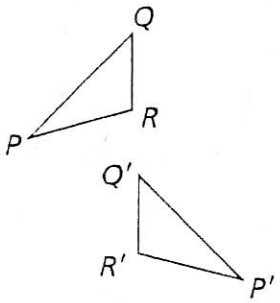
Ⓓ Add a negative number to its x-coordinate and a negative number to the y.

9 In ΔABC, vertex A moves up 2 and right 3. Vertex B moves up 2 and right 3. How must vertex C move if the end result is a simple translation?

Answer: _____

Congruence and Similarity

6 These two triangles are congruent.



Which sequence of two transformations changes ΔPQR into $\Delta P'Q'R'$?

Ⓐ flip vertically, then rotate

Ⓑ flip horizontally, then rotate

Ⓒ flip vertically, then translate

Ⓓ flip horizontally, then translate

Step-By-Step

For **example 6**, choose the two transformations that will change one triangle into another. Remember that "flip" is another name for a reflection.

1 Compare the two triangles. They show a reflection and a translation, but not a _____. You can therefore eliminate answer choices ____ and ____.

2 Compare answer choices C and D. Do the triangles show a vertical or a horizontal flip?

_____

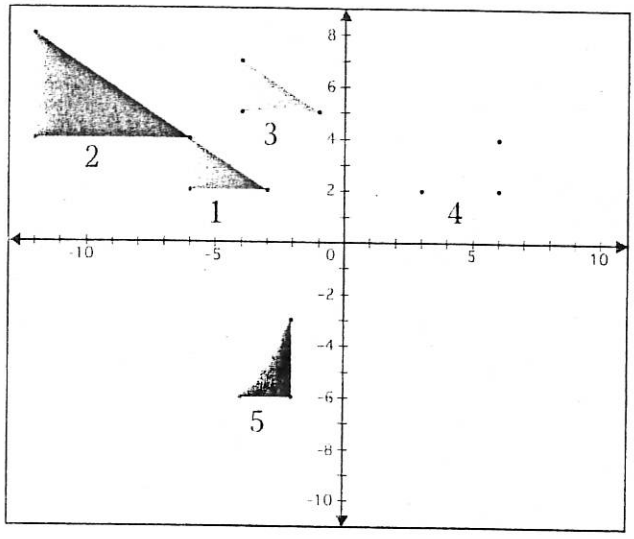
NAME:

GEOMETRY

CCSS 8.G.3

Up, Down, and All Around

There are five triangles in the diagram below. Triangle 1 is the original triangle. The other four triangles came from changing Triangle 1 in some way.



Work with a partner to finish the following statements about the triangles in the diagram above.

1. To change Triangle 1 into Triangle 4, _____

_____

2. To change Triangle 1 into Triangle 3, _____

_____

3. To change Triangle 1 into Triangle 5, _____

_____

4. To change Triangle 1 into Triangle 2, _____

_____

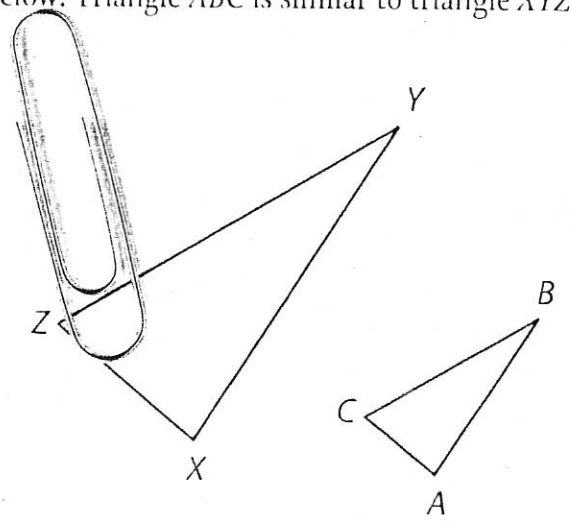
NAME:

GEOMETRY

CCSS 8.G.4

Copy Cat

Examine the two triangles below. Triangle ABC is similar to triangle XYZ and is $\frac{1}{2}$ the size.



1. Which side of triangle ABC is in the same place as side XY?

2. Which side of triangle ABC is in the same place as side YZ?

3. Which side of triangle ABC is in the same place as side ZX?

4. Do angles A and X appear to be the same size?

5. Do angles B and Y appear to be the same size?

6. Do angles C and Z appear to be the same size?

7. How do the areas of the two triangles compare to one another?