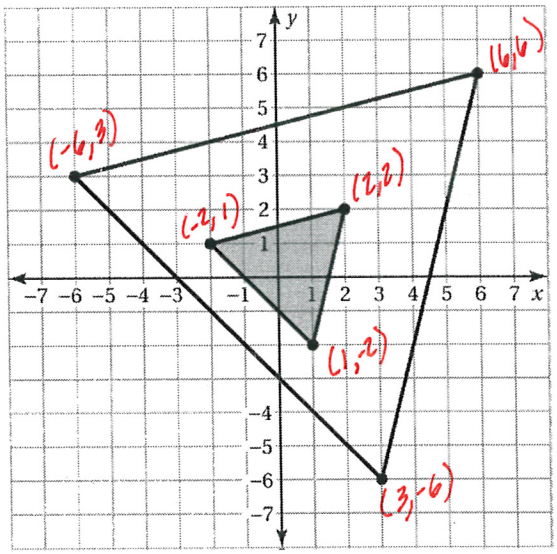
Name Answers Date

2.7 – Dilations (Part 1)

Essential Questions - How can you enlarge or reduce a figure in the coordinate plane?

ACTIVITY 1: Comparing Triangles in a Coordinate Plane

1) Work with a partner. Write the coordinates of the vertices of the shaded triangle. Then write the coordinates of the vertices of the nonshaded triangle.



Shaded	Non-shaded
(-2,1)	(-6,3)
(2,2)	(6,6)
(1,-2)	(3,-6)

2) How are the two sets of coordinates related?

The coordinates of the non-shaded triangle are 3 times bigger compared to the shaded triangle.

3) How are the two triangles related? **Explain** your reasoning.

The non-shaded triangle is an enlargement of the shaded one due to it's size. The triangles are similar due to the fact that sides must be proportional

4) Draw a dashed triangle whose coordinates are twice the values of the corresponding coordinates of the shaded triangle. How are the dashed and shaded triangles related?. **Explain** your reasoning.

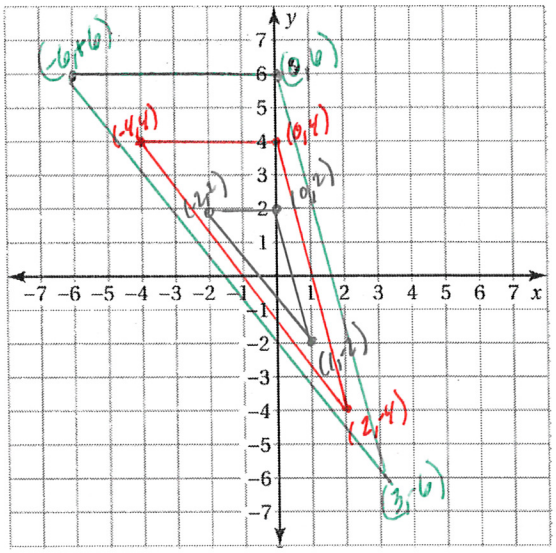
The dashed triangle is the same shape as the shaded triangle, but bigger than the shaded triangle. They are similar triangles.

5) How are the coordinates of the nonshaded and dashed triangles related? How are the two triangles related? **Explain** your reasoning.

The coordinates of the nonshaded triangle are multiplied by $\frac{2}{3}$ to get the dashed triangle. They are similar.

ACTIVITY 2: Drawing Triangles in a Coordinate Plane

6) Draw the triangle whose vertices are $(0, 2)$, $(-2, 2)$, and $(1, -2)$. Label the vertices on the graph.



7) Multiply each coordinate of the vertices by 2 to obtain three new vertices. Draw the triangle given by the three new vertices in a different color and label the new coordinates. How are the two triangles related?

The new triangle is similar and bigger than the original triangle. It has a scale factor of 2.

8) Repeat #7 by multiplying by 3 instead of 2. Again, use a different color for this and label the coordinates.

ACTIVITY 3: Summarizing Transformations

9) Work with a partner. Make a table that summarizes the relationships between the original figure and its image for the four types of transformations (translations, etc.) you studied in this chapter.

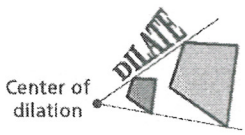
Transformation	Description
Translation	Same size & shape, moved from one place to another
Reflection	Same size & shape, mirror image of the original
Rotation	Same size & shape, rotated around a point
Dilation	Different size, same shape.

10) **IN YOUR OWN WORDS,** how can you enlarge or reduce a figure in the coordinate plane if you know the coordinates of the original figure.

Multiply the original coordinates by a number (the scale factor).

Complete the following by looking it up in your book.

11) A dilation is a transformation in which a figure is made **larger** or **smaller** with respect to a point called the center of dilation.

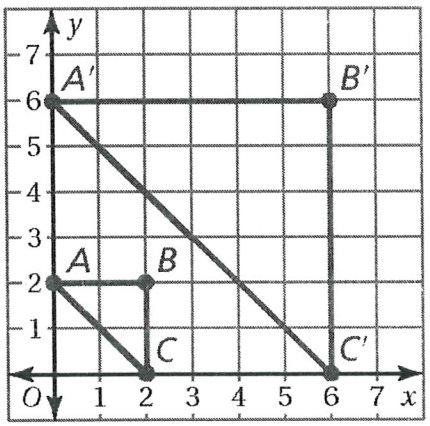


12) The ratio of the side lengths of the image to the corresponding side lengths of the original figure is the scale factor of the dilation.

13) In other words, the scale factor is the number you multiply to the original coordinates to get the new coordinates.

Complete the following using the image below.

14)



a) What are the coordinates of the original?

A(0,2), B(2,2), C(2,0)

b) What are the coordinates of the image?

A'(0,6), B'(6,6), C'(6,0)

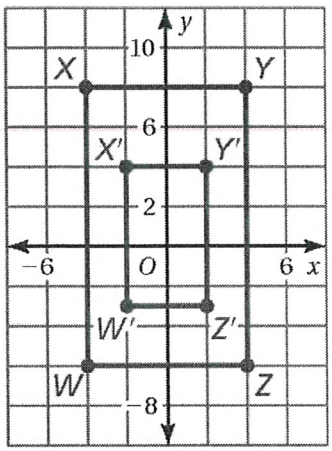
15) a) Observe the relationship between the coordinates of the original vertices and the image vertices. What do you believe is the scale factor of the image?

3

b) Is this an enlargement or a reduction?

Complete the following using the image below.

16)



a) What are the coordinates of the original?

W(-4,-6), X(-4,8), Y(4,8), Z(4,-6)

b) What are the coordinates of the image?

W'(-2,-3), X'(-2,4), Y'(2,4), Z'(2,-3)

17) a) Observe the relationship between the coordinates of the original vertices and the image vertices. What do you believe is the scale factor of the image?

$\frac{1}{2}$

b) Is this an enlargement or a reduction?

Summary

18) From you have observed in the last couple of problems, what happens to the original if the scale factor is **greater than 1**.

It is enlarged.

19) From you have observed in the last couple of problems, what happens to the original if the scale factor is **less than 1**.

It is reduced.

20) In your own words, what is a dilation?

when you enlarge or reduce a figure in reference to the point of dilation.