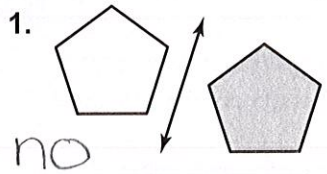
Name _____ Date _____

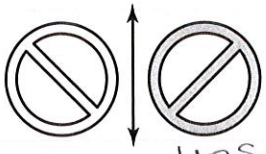
2.3 Practice

For use after Lesson 2.3

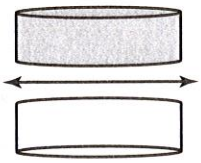
Tell whether the shaded figure is a reflection of the nonshaded figure.

1. 

no

2. 

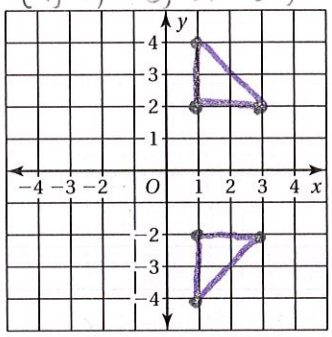
yes

3. 

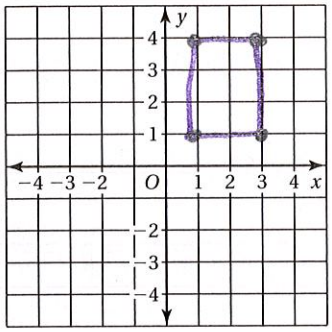
yes

Draw the figure and its reflection in the *x*-axis. Identify the coordinates of the image. for x-reflection $(x, y) \rightarrow (x, -y)$

4. $A(1, 2)$, $B(3, 2)$, $C(1, 4)$ $(1, -2)$ $(3, -2)$ $(1, -4)$

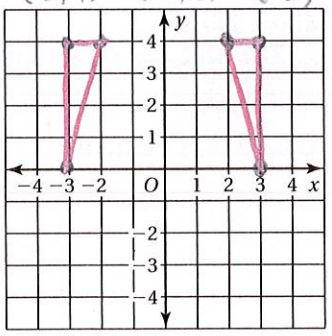


5. $W(3, 1)$, $X(3, 4)$, $Y(1, 4)$, $Z(1, 1)$

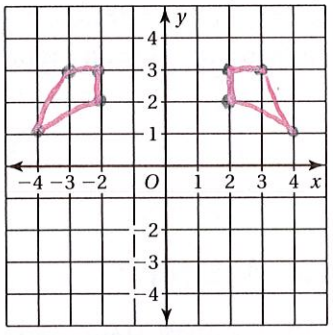


Draw the figure and its reflection in the *y*-axis. Identify the coordinates of the image. reflect to y $(x, y) \rightarrow (-x, y)$ $(x, y) \rightarrow (-x, y)$

6. $J(3, 4)$, $K(3, 0)$, $L(2, 4)$ $(-3, 4)$ $(-3, 0)$ $(-2, 4)$

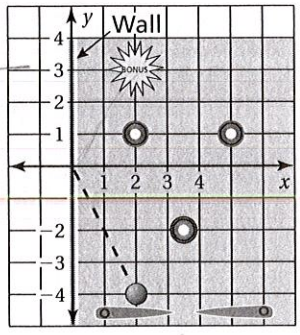


7. $M(2, 2)$, $N(2, 3)$, $P(3, 3)$, $Q(4, 1)$ $(-2, 2)$ $(-2, 3)$ $(-3, 3)$ $(-4, 1)$



8. In a pinball game, when you perfectly reflect the ball off of the wall, will the ball hit the bonus target?

no reflect would go the other way



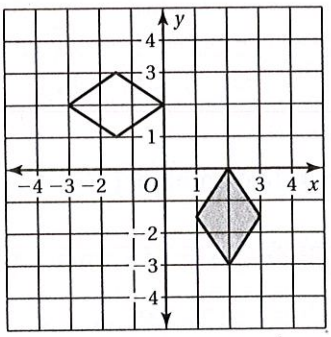
Name _____ Date _____

2.4 Practice

For use after Lesson 2.4

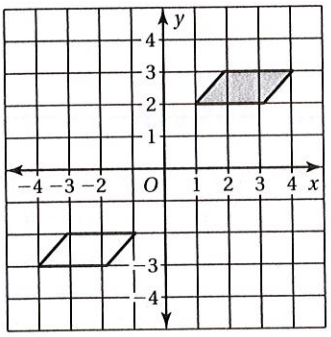
Tell whether the shaded figure is a rotation of the nonshaded figure about the origin. If so, give the angle and the direction of rotation.

1.



not about origin

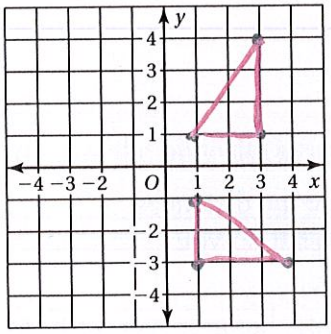
2.



yes 180°

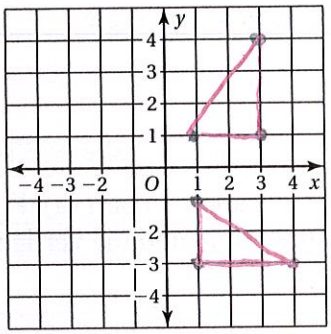
The vertices of a triangle are $A(1, 1)$, $B(3, 1)$, and $C(3, 4)$. Rotate the triangle as described. Find the coordinates of the image.

3. 90° clockwise about the origin



A' (1, −1)
B' (1, −3)
C' (4, −3)

4. 270° counterclockwise about vertex A (origin)



Same as 90° clockwise
$(x, y) \rightarrow (y, -x)$
(1, −1) (1, −3) (4, −3)

5. A triangle is rotated 180° about the origin. Its image is reflected in the x-axis. The vertices of the final triangle are $(-4, -4)$, $(-2, -4)$, and $(-3, -1)$. What are the vertices of the original triangle?

180° $(x, y) \rightarrow (-x, -y)$ Reflect over x $(x, y) \rightarrow (x, -y)$

$(-4, -4) \rightarrow (4, 4) \rightarrow (4, -4)$
$(-2, -4) \rightarrow (2, 4) \rightarrow (2, -4)$
$(-3, -1) \rightarrow (3, 1) \rightarrow (3, -1)$

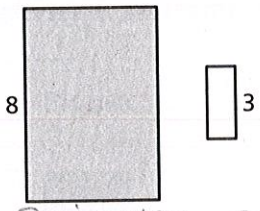
Name _____ Date _____

2.6 Practice

For use after Lesson 2.6

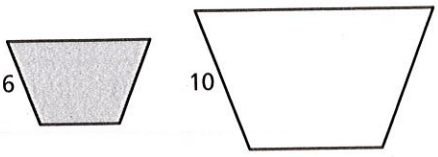
The two figures are similar. Find the ratios (shaded to nonshaded) of the perimeters and of the areas.

1.



corr sides: $\frac{8}{3}$ Perimeter: $\frac{8}{3}$ area: $\left(\frac{8}{3}\right)^2 = \frac{64}{9}$

2.

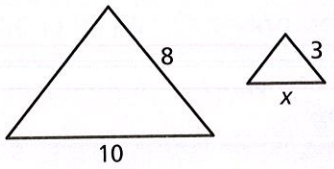


corr sides: $\frac{6}{10} \downarrow \frac{3}{5}$ Perimeter: $\frac{6}{10} \downarrow \frac{3}{5}$ area: $\left(\frac{6}{10}\right)^2 = \frac{36}{100} \div 4 = \frac{9}{25}$

$\left(\frac{3}{5}\right)^2 = \frac{9}{25}$

The polygons are similar. Find *x*.

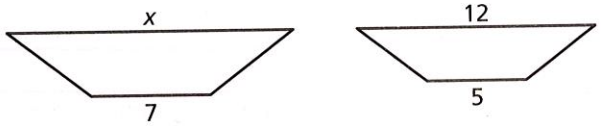
3.



$\frac{8}{10} = \frac{3}{x}$ $x = 3.75$

$\frac{8x}{8} = \frac{30}{8}$

4.



$\frac{x}{7} = \frac{12}{5}$

$\frac{5x}{5} = \frac{84}{5} \approx 16.8$

5. You buy two picture frames that are similar. The ratio of the corresponding side lengths is 4 : 5. What is the ratio of the areas?

corr sides $\frac{4}{5} = \frac{4}{5} \times \frac{4}{5} = \frac{16}{25}$ area

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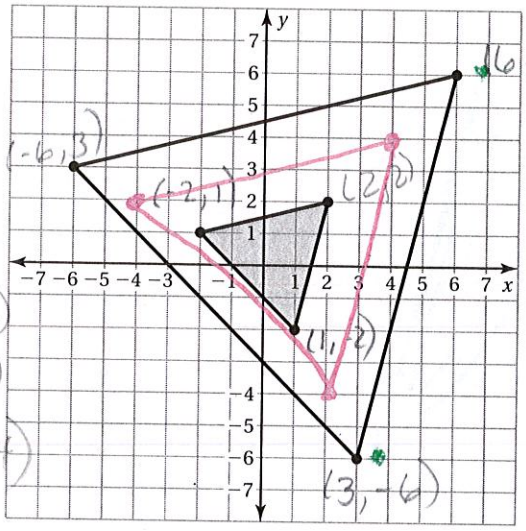
2.7 Dilations

For use with Activity 2.7

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

1 ACTIVITY: Comparing Triangles in a Coordinate Plane

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.



(-2, 1) x 2 = (-4, 2)
(2, 2) x 2 = (4, 4)
(1, -2) x 2 = (2, -4)

a. How are the two sets of coordinates related?

the vertices or points of shaded triangle are multiplied by 3 to get coordinates of large triangle

b. How are the two triangles related? Explain your reasoning.

Large triangle 3 times bigger - see above + coordinates

c. 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.

red

Similar triangles

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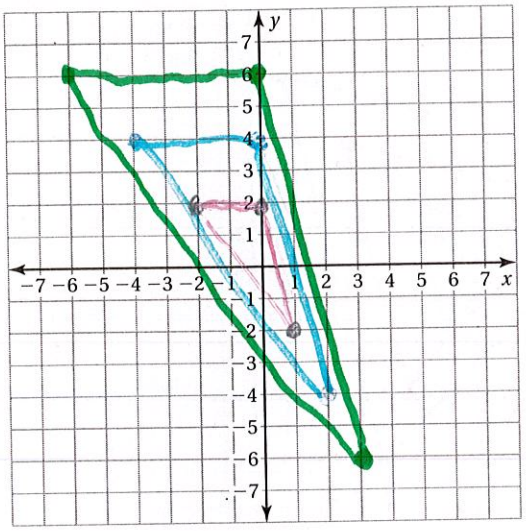
2.7 Dilations (continued)

d. How are the coordinates of the nonshaded and dashed (red) triangles related? How are the two triangles related? Explain your reasoning.

multiply coordinates of nonshaded by $\frac{2}{3}$ to get dashed (red) line, similar triangles

2 ACTIVITY: Drawing Triangles in a Coordinate Plane

Work with a partner.



a. Draw the triangle whose vertices are $(0, 2)$, $(-2, 2)$, and $(1, -2)$.

(0,4) (-4,4) (2,-4)

b. Multiply each coordinate of the vertices by 2 to obtain three new vertices. Draw the triangle given by the three new vertices. How are the two triangles related?

blue - similar (scale factor of 2)

c. Repeat part (b) by multiplying by 3 instead of 2.

(0,6) (-6,6) (3,-6)

Similar - scale of 3

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3 ACTIVITY: Summarizing Transformations

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

Translation → same size + shape
slides left, right, up, down

Reflection → same size + shape, mirror image

Rotation → same size + shape, rotated about a point

Dilation → different size, same shape, image is enlargement or reduction

What Is Your Answer?

4. IN YOUR OWN WORDS How can you enlarge or reduce a figure in the coordinate plane?

multiply each coordinate by same value
reduce (value b/t 0 and 1)
enlarge (value greater than 1)

5. Describe how knowing how to enlarge or reduce figures in a technical drawing is important in a career such as drafting.

- details of an object
- accuracy
- possibilities are endless