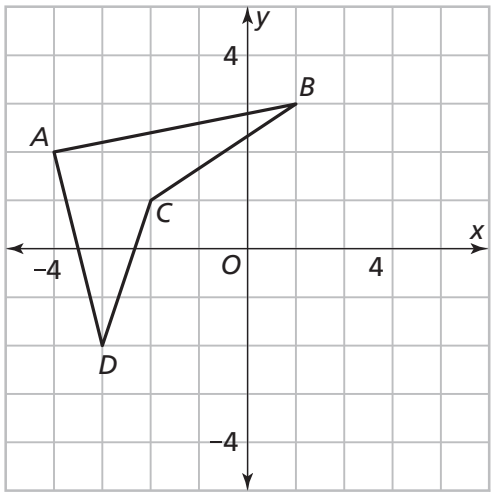
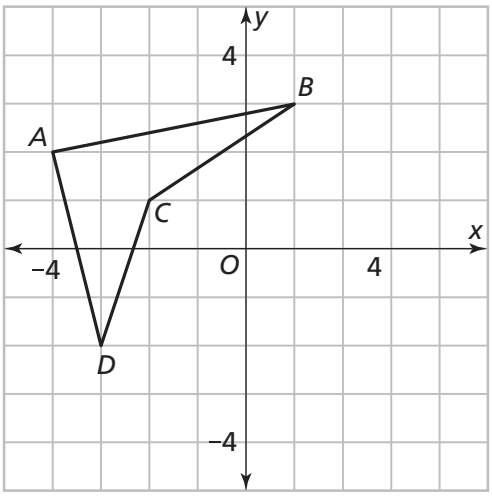
Additional Practice *(continued)*

For Exercises 10–12, refer to the grids below.





10. a. On the left-hand above grid, draw the final image created by rotating polygon *ABCD* 90° counterclockwise about the origin and then reflecting the image in the *x*-axis.

b. On the right-hand above grid, draw the final image created by reflecting polygon *ABCD* in the *x*-axis and then rotating the image 90° counterclockwise about the origin.

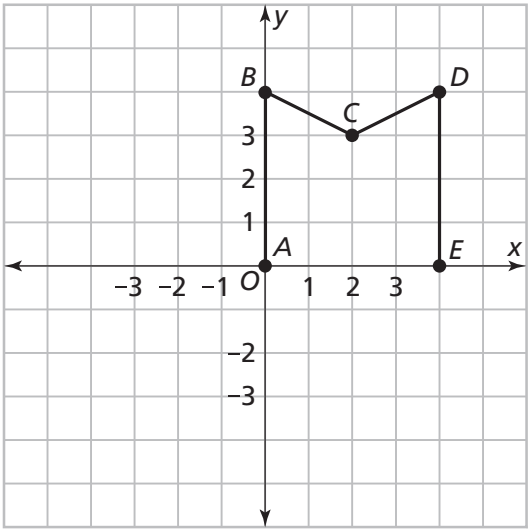
c. Are the final images in parts (a) and (b) the same? Explain.

11. What single transformation is equivalent to a counterclockwise rotation of 90° about the origin followed by a rotation of 270° counterclockwise about the origin?

12. What single transformation is equivalent to a reflection in the *y*-axis, followed by a reflection in the *y*-axis, followed by a reflection in the *y*-axis?

Additional Practice *(continued)*

13. Use the figure at the right to answer parts (a)–(c).

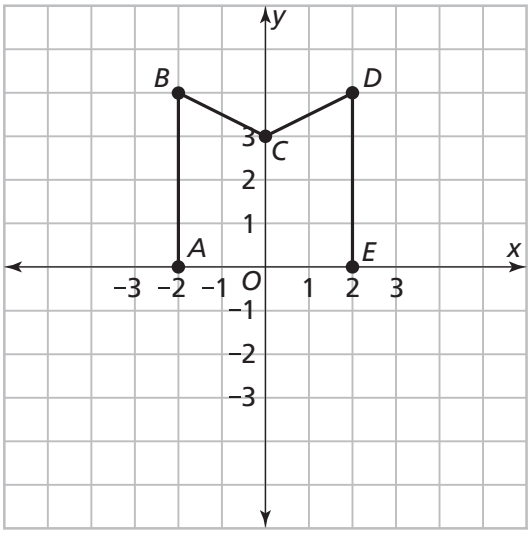


a. Write the coordinates for point A, B, C, D, E.

b. If the figure (the "M") was reflected in the x-axis, write the coordinates of the images of A, B, C, D, and E.

c. If the figure (the "M") was reflected in the y-axis, write the coordinates of the images of A, B, C, D, and E.

14. Use the figure at the right to answer parts (a)–(c).



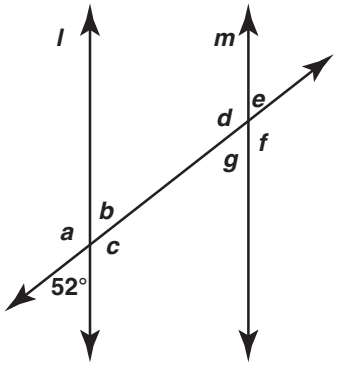
a. Write the coordinates for point A, B, C, D, E.

b. If the figure (the "M") was reflected in the x-axis, write the coordinates of the images of A, B, C, D, and E.

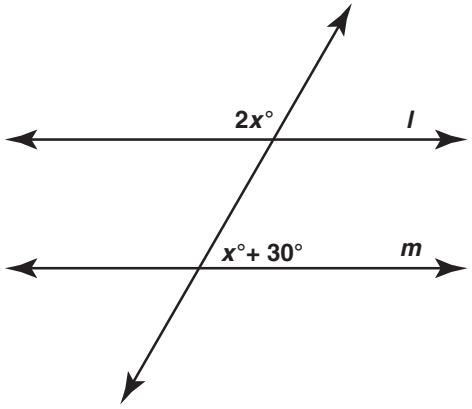
c. If the figure (the "M") was reflected in the y-axis, write the coordinates of the images of A, B, C, D, and E.

Additional Practice *(continued)*

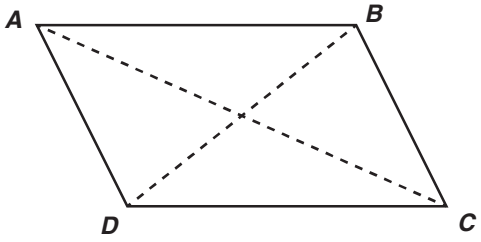
25. Lines l and m are parallel. Find the measures of angles a–g.



26. Lines l and m are parallel. What is the value of x?



27. Quadrilateral $ABCD$ is a parallelogram with diagonals $\overline{AC}$ and $\overline{BD}$. Can you be sure that triangles ABD and CDB are congruent? Explain your reasoning.



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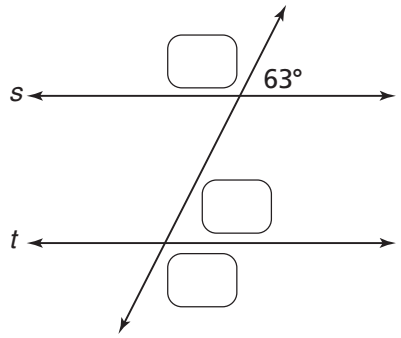
Additional Practice: Digital Assessments

Investigation 3

Butterflies, Pinwheels, and Wallpaper

28. Lines s and t are parallel. Use the values in the bank to complete the angle measurements. Values may be used more than once.

63°	117°	27°	243°



29. Use the ordered pairs on the tiles to complete the table.

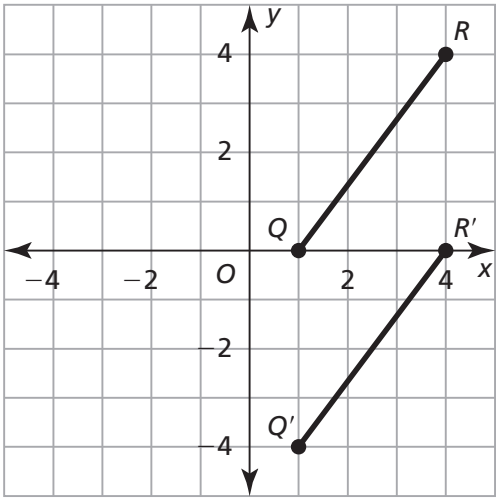
(2, 1) (1, 2) (2, −1) (2, 0)

Point	Transformation	Coordinates of the Image
(2, 1)	Reflection in the x-axis	
(2, 0)	Reflection in the x-axis	
(2, −1)	Reflection in the x-axis	

30. A segment and its translation are shown.

Circle the numbers and symbols that make the statement true.

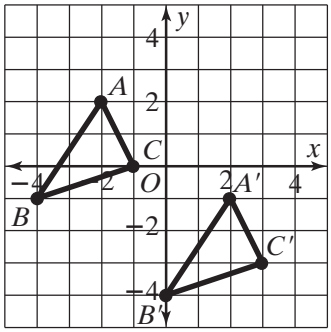
The rule for the translation is $(x, y) \rightarrow \begin{bmatrix} (x, y+4) \\ (x, y-4) \\ (x+3, y-4) \\ (x-3, y+4) \end{bmatrix}$.



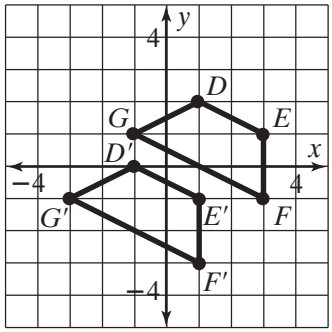
Skill: Transforming Coordinates *(continued)*

Write a rule to describe each translation.

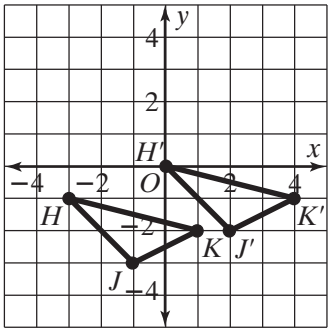
10. $(x, y) \rightarrow$



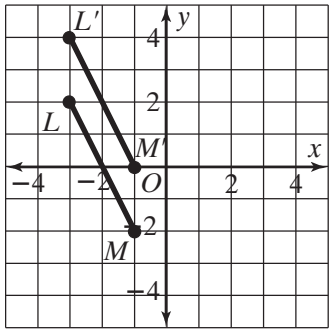
11. $(x, y) \rightarrow$



12. $(x, y) \rightarrow$



13. $(x, y) \rightarrow$



A point and its image after a translation are given. Write a rule to describe the translation.

14. $A(9, -4), A'(2, -1) \quad (x, y) \rightarrow$

15. $B(-3, 5), B'(-5, -3) \quad (x, y) \rightarrow$

Write a rule to describe each statement.

16. In a 90° clockwise rotation about the origin, move point (x, y) to

17. In a 180° rotation about the origin, move point (x, y) to

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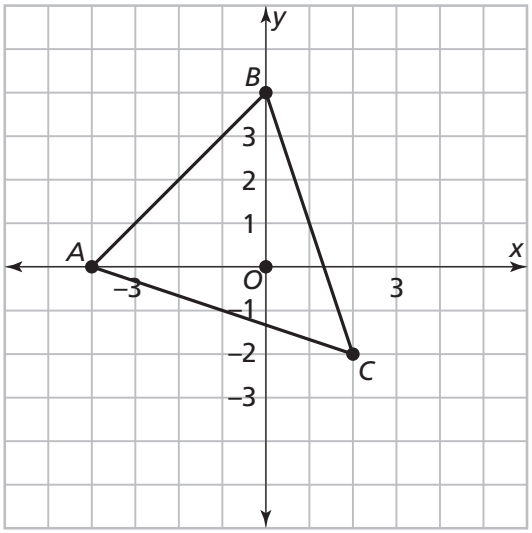
Additional Practice

Investigation 4

Butterflies, Pinwheels, and Wallpaper

For Exercises 1–4, use the figure at the right.



1. On the grid, draw the image of triangle ABC under a dilation with center $(0, 0)$ and scale factor $\frac{1}{2}$. Label the image $A'B'C'$.

2. a. Find the perimeter of triangle ABC. Round to the nearest tenth.

b. Predict the perimeter of triangle $A'B'C'$ and justify your prediction. Then find the perimeter of triangle $A'B'C'$ and compare it to your prediction.

3. How are the areas of ABC and $A'B'C'$ related to the scale factor?

4. a. Find the slopes of the sides of triangle ABC.

b. Predict the slopes of the sides of $A'B'C'$ and justify your predictions. Then find the slopes of the sides of triangle $A'B'C'$ and compare them to your predictions.

Additional Practice *(continued)*

For Exercises 5–6, use the following information.

In rectangle *RECT*, $RE = 8$ inches and $EC = 6$ inches. In rectangle $R'E'C'T'$, $R'E' = 12$ inches and $E'C' = 9$ inches.

5. a. What is the scale factor of the dilation of rectangle *RECT* to rectangle $R'E'C'T'$?

b. What is the scale factor of the dilation of rectangle $R'E'C'T'$ to rectangle *RECT*?

6. a. What do you think will be the relationship between the lengths of the diagonals $\overline{RC}$ and $\overline{R'C'}$? Explain your reasoning.

b. Check your answer to part (a) by finding the lengths of diagonals $\overline{RC}$ and $\overline{R'C'}$. Would you change your answer to part (a)? Why or why not?

Additional Practice *(continued)*

For Exercise 7, use the following information.

In rectangle $RECT$, $RE = 8$ inches and $EC = 6$ inches. In rectangle $R'E'C'T'$, $R'E' = 12$ inches and $E'C' = 9$ inches.

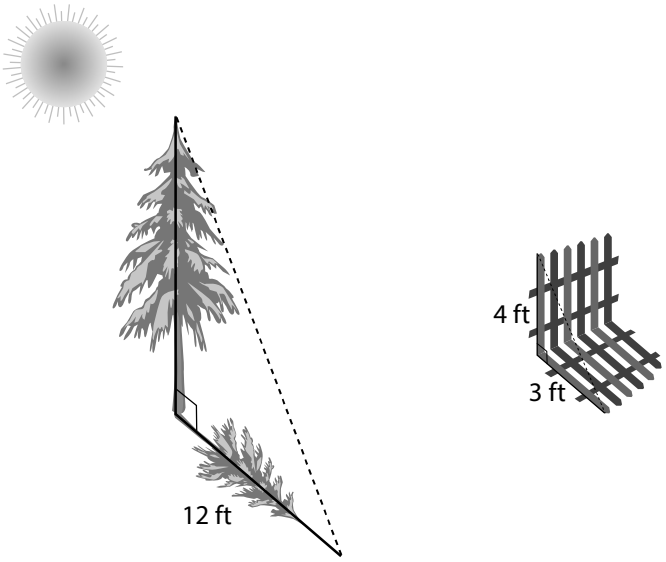
7. a. Suppose you transform rectangle $R'E'C'T'$ to rectangle $R''E''C''T''$ using a 90° clockwise rotation. How will the perimeter of $R''E''C''T''$ be related to the perimeters of $RECT$ and $R'E'C'T'$? Explain your reasoning.

b. How will the area of $R''E''C''T''$ be related to the areas of $RECT$ and $R'E'C'T'$? Explain your reasoning.

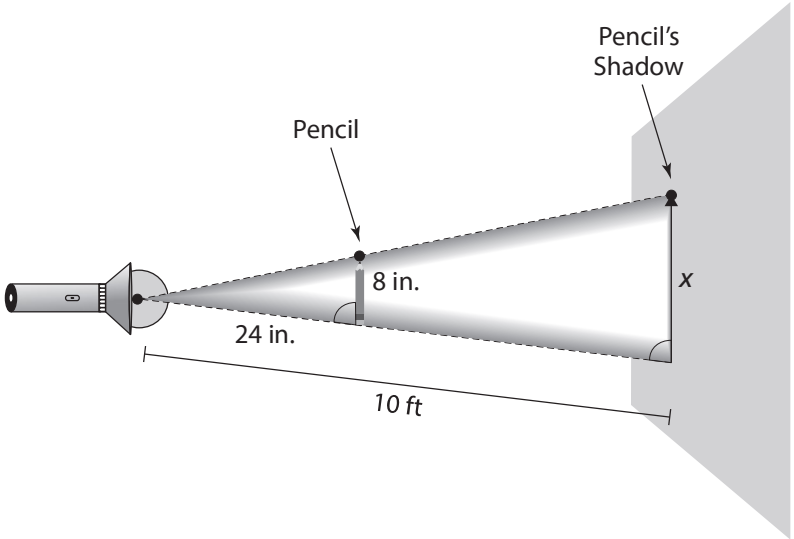
c. How will the slopes of the sides of $R''E''C''T''$ be related to the slopes of the sides of $RECT$ and $R'E'C'T'$? Explain your reasoning.

Additional Practice *(continued)*

19. Shadows are created when objects block the rays of sunlight. The angle at which light is blocked is related to the time of day and is congruent for all objects in the same area. In the diagram below, the sun hits a tree and fence post at congruent angles and creates shadows of 12 feet and 3 feet, respectively. If the fence post is 4 feet tall, how tall is the tree? The figures are not drawn to scale.



20. An 8-inch pencil is placed 24 inches in front of a flashlight so that its shadow is projected onto a wall that is 10 feet away. The pencil and its shadow are parallel. What is x, the length of the pencil's shadow on the wall?



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Additional Practice: Digital Assessments

Investigation 4

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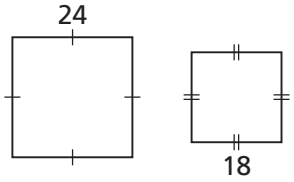
21. Use the values in the bank to complete the statements.

0.5	2.0	1.5	2.5

a. In rectangle $ABCD$, $AB = 10$ centimeters and $BC = 20$ centimeters. In rectangle $A´B´C´D´$, $A´B´ = 5$ centimeters and $B´C´ = 10$ centimeters. The scale factor of the dilation of rectangle $ABCD$ to rectangle $A´B´C´D´$ is _____ .

b. In rectangle $QRST$, $QR = 6$ centimeters and $RS = 2$ centimeters. In rectangle $Q´R´S´T´$, $Q´R´ = 15$ centimeters and $R´S´ = 5$ centimeters. The scale factor of the dilation of rectangle $ABCD$ to rectangle $A´B´C´D´$ is _____.

22. Circle the number that makes the statement true.

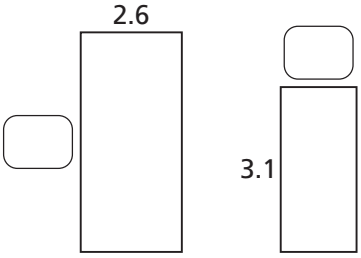


The scale factor of the dilation of the figure on the left to the figure on the right is $\left[\frac{1}{6}, \frac{1}{2}, \frac{3}{4}, 1\frac{1}{2}\right]$.

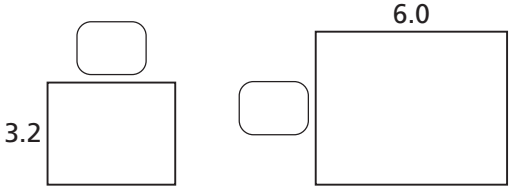
23. Use the values in the bank to complete the missing measurements of the similar figures. A scale factor is given for each pair of figures.

4.0	4.8	1.3	0.5	1.5	6.2

a. scale factor 0.5



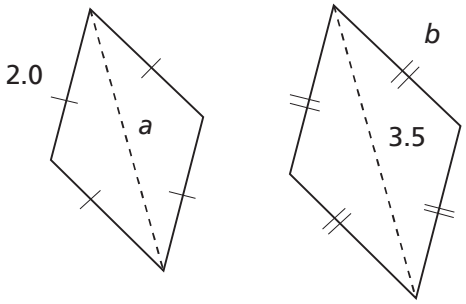
b. scale factor 1.5



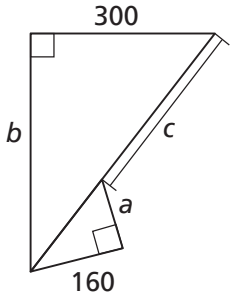
Skill: Scale Factors *(continued)*

For Exercises 11–12, use the given scale factor. Find the missing measurements of the similar figures.

11. scale factor: 1.1



12. scale factor: 0.4



13. A rectangle with a length of 7 inches and width of 5 inches is dilated by a scale factor of 2.25. What is the perimeter of the new rectangle?

14. The sides of a triangle with an area of 100 square centimeters are dilated by a scale factor of 0.5. What is the area of the new triangle?