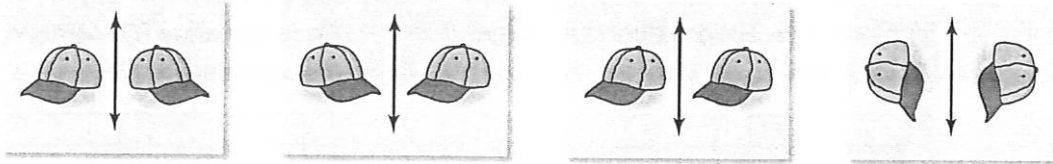


2.3 Exercises

Vocabulary and Concept Check

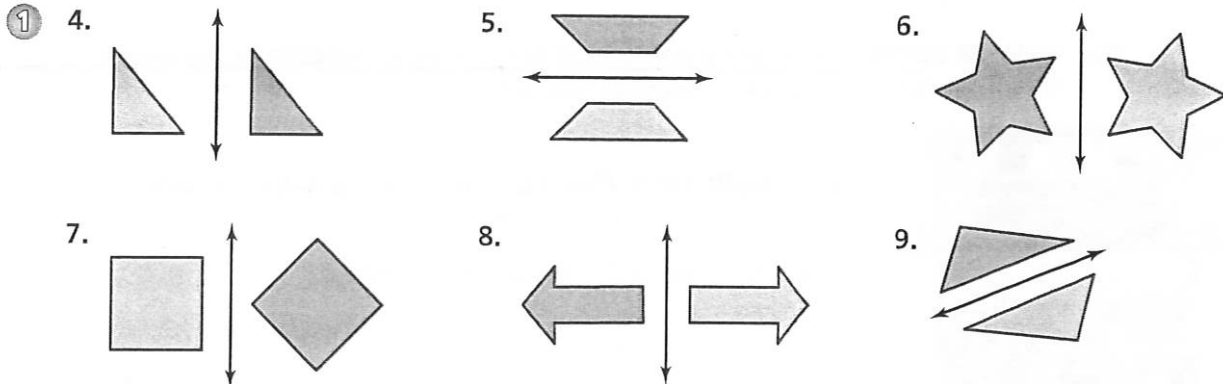
1. **WHICH ONE DOESN'T BELONG?** Which transformation does *not* belong with the other three? Explain your reasoning.



2. **WRITING** How can you tell when one figure is a reflection of another figure?
3. **REASONING** A figure lies entirely in Quadrant I. The figure is reflected in the x -axis. In which quadrant is the image?

Practice and Problem Solving

Tell whether the blue figure is a reflection of the red figure.



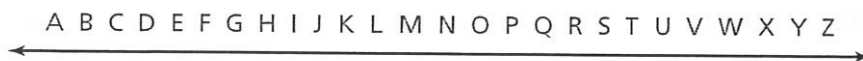
Draw the figure and its reflection in the x -axis. Identify the coordinates of the image.

10. $A(3, 2), B(4, 4), C(1, 3)$ 11. $M(-2, 1), N(0, 3), P(2, 2)$
12. $H(2, -2), J(4, -1), K(6, -3), L(5, -4)$ 13. $D(-2, -1), E(0, -1), F(0, -5), G(-2, -5)$

Draw the figure and its reflection in the y -axis. Identify the coordinates of the image.

14. $Q(-4, 2), R(-2, 4), S(-1, 1)$ 15. $T(4, -2), U(4, 2), V(6, -2)$
16. $W(2, -1), X(5, -2), Y(5, -5), Z(2, -4)$ 17. $J(2, 2), K(7, 4), L(9, -2), M(3, -1)$

18. **ALPHABET** Which letters look the same when reflected in the line?



The coordinates of a point and its image are given. Is the reflection in the x -axis or y -axis?

19. $(2, -2) \rightarrow (2, 2)$

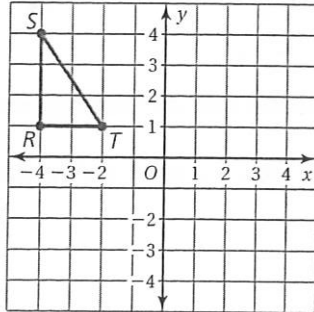
20. $(-4, 1) \rightarrow (4, 1)$

21. $(-2, -5) \rightarrow (2, -5)$

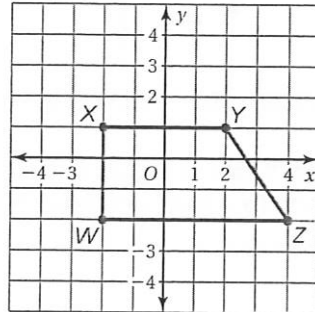
22. $(-3, -4) \rightarrow (-3, 4)$

Find the coordinates of the figure after the transformations.

23. Translate the triangle 1 unit right and 5 units down. Then reflect the image in the y -axis.



24. Reflect the trapezoid in the x -axis. Then translate the trapezoid 2 units left and 3 units up.



25. **REASONING** In Exercises 23 and 24, is the original figure congruent to the final image? Explain.

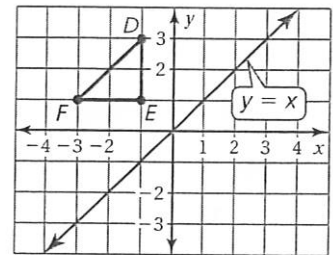
26. **NUMBER SENSE** You reflect a point (x, y) in the x -axis, and then in the y -axis. What are the coordinates of the final image?



27. **EMERGENCY VEHICLE** Hold a mirror to the left side of the photo of the vehicle.

- What word do you see in the mirror?
- Why do you think it is written that way on the front of the vehicle?

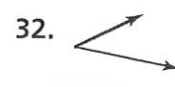
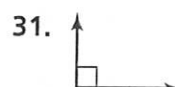
28. **Critical Thinking** Reflect the triangle in the line $y = x$. How are the x - and y -coordinates of the image related to the x - and y -coordinates of the original triangle?



Fair Game Review

what you learned in previous grades & lessons

Classify the angle as *acute*, *right*, *obtuse*, or *straight*. (Skills Review Handbook)



33. **MULTIPLE CHOICE** 36 is 75% of what number? (Skills Review Handbook)

(A) 27

(B) 48

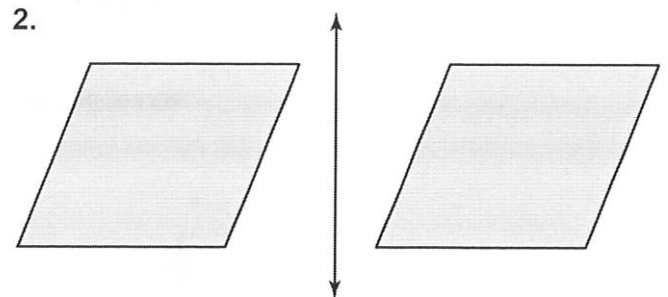
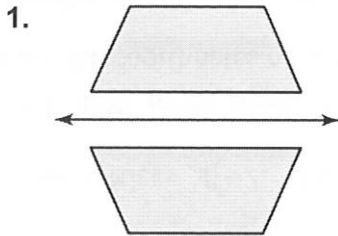
(C) 54

(D) 63

2.3

Practice A

Tell whether one figure is a reflection of the other figure.



Draw the figure and its reflection in the x -axis. Identify the coordinates of the image.

3. $E(0, 2), F(3, 1), G(4, 3)$

4. $H(-3, 2), I(-1, 5), J(2, 1)$

Draw the figure and its reflection in the y -axis. Identify the coordinates of the image.

5. $X(0, -1), Y(2, 3), Z(4, -2)$

6. $U(-5, 1), V(-4, -2), W(-2, 0)$

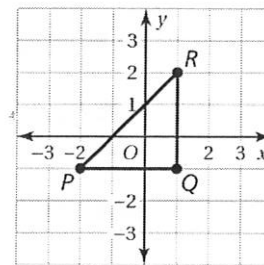
7. What does the word MOM spell when it is reflected in a horizontal line?

The coordinates of a point and its image are given. Is the reflection in the x -axis or y -axis?

8. $(-5, 2) \rightarrow (5, 2)$

9. $(4, 3) \rightarrow (4, -3)$

10. Translate the triangle 2 units left and 1 unit up. Then reflect the image in the x -axis. Graph the resulting triangle.



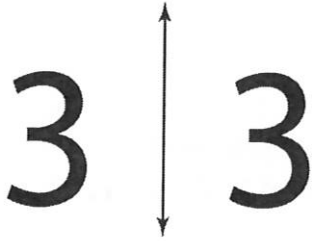
11. A figure is in Quadrant IV. The figure is reflected in the y -axis. In which quadrant is the image?

2.3

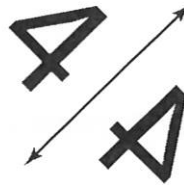
Practice B

Tell whether one figure is a reflection of the other figure.

1.



2.



Draw the figure and its reflection in the x -axis. Identify the coordinates of the image.

3. $K(-3, 3), L(-2, 1), M(1, 2), N(2, 5)$ 4. $O(-2, -1), P(-1, -3), Q(1, -4), R(3, -1)$

Draw the figure and its reflection in the y -axis. Identify the coordinates of the image.

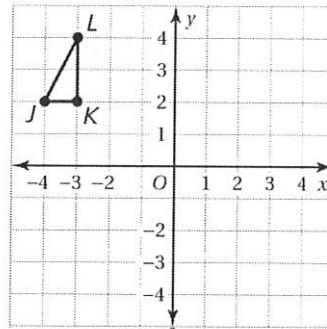
5. $B(2, -3), C(3, 1), D(5, 3), E(3, 0)$ 6. $G(-5, -5), H(-3, -1), I(-2, 4), J(-1, -1)$

7. What does the word “pop” spell when it is reflected in a horizontal line?

The coordinates of a point and its image are given. Is the reflection in the x -axis or y -axis?

8. $(0, 3) \rightarrow (0, -3)$ 9. $(1, 5) \rightarrow (-1, 5)$

10. Reflect the triangle in the x -axis. Then reflect the image in the y -axis. Graph the resulting triangle.



11. ! ABC has vertices $A(-2, -1), B(4, 2), C(2, -2)$.
- Reflect ! ABC in the x -axis. Then reflect ! $A'B'C'$ in the y -axis. What are the coordinates of the resulting triangle?
 - How are the x - and y -coordinates of the resulting triangle related to the x - and y -coordinates of ! ABC ?



Puzzle Time

What Kind Of Coat Can You Put On Only When It's Wet?

Write the letter of each answer in the box containing the exercise number.

Reflect the point in the x -axis. Identify the coordinates of the image.

1. $(2, 5)$

2. $(-3, 7)$

R. $(-2, -5)$ S. $(-2, 5)$ T. $(2, -5)$ A. $(-3, -7)$ B. $(3, 7)$ C. $(3, -7)$

3. $(-4, -12)$

4. $(13, -8)$

D. $(4, -12)$ E. $(4, 12)$ F. $(-4, 12)$ M. $(-13, 8)$ N. $(13, 8)$ O. $(-13, -8)$

Reflect the point in the y -axis. Identify the coordinates of the image.

5. $(7, -6)$

6. $(9, 5)$

O. $(-7, -6)$ P. $(-7, 6)$ Q. $(7, 6)$ H. $(9, -5)$ I. $(-9, 5)$ J. $(-9, -5)$

7. $(-15, -12)$

8. $(-23, 8)$

A. $(15, -12)$ B. $(15, 12)$ C. $(-15, 12)$ M. $(23, -8)$ N. $(-23, -8)$ O. $(23, 8)$

The coordinates of a point and its image are given. Is the reflection in the x -axis, y -axis, or neither?

9. $(11, 7) \rightarrow (11, -7)$

10. $(-4, -5) \rightarrow (4, -5)$

A. x -axis B. y -axis C. neither B. x -axis C. y -axis D. neither

11. $(-8, 8) \rightarrow (8, -8)$

12. $(53, -26) \rightarrow (-53, -26)$

R. x -axis S. y -axis T. neither O. x -axis P. y -axis Q. neither

2		10	5	7	1		8	3		12	9	6	4	11
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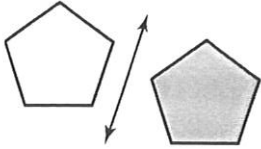
2.3

Practice

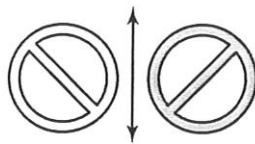
For use after Lesson 2.3

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

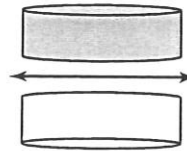
1.



2.

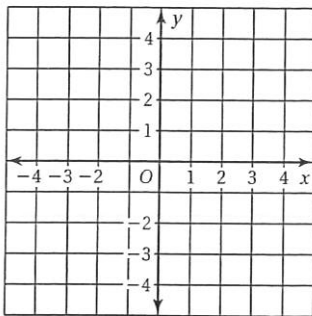


3.



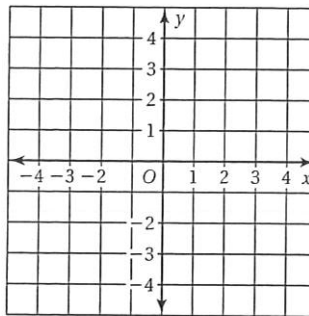
Draw the figure and its reflection in the x-axis. Identify the coordinates of the image.

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



$A' =$
 $B' =$
 $C' =$

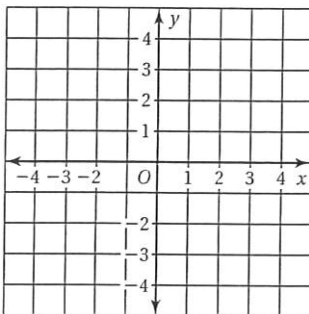
5. $W(3, 1), X(3, 4), Y(1, 4), Z(1, 1)$



$W' =$
 $X' =$
 $Y' =$
 $Z' =$

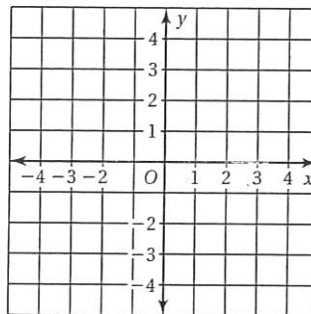
Draw the figure and its reflection in the y-axis. Identify the coordinates of the image.

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



$J' =$
 $K' =$
 $L' =$

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



$M' =$
 $N' =$
 $P' =$
 $Q' =$

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

