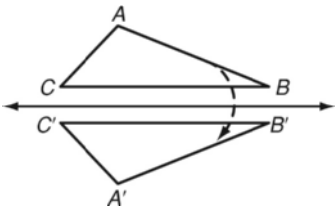
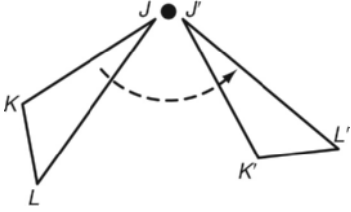
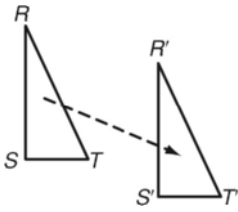


**LESSON**  
**1-7**

# Reteach

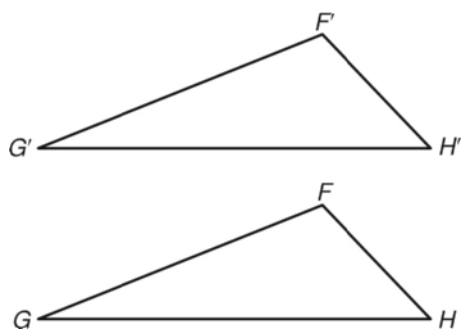
## Transformations in the Coordinate Plane

In a transformation, each point of a figure is moved to a new position.

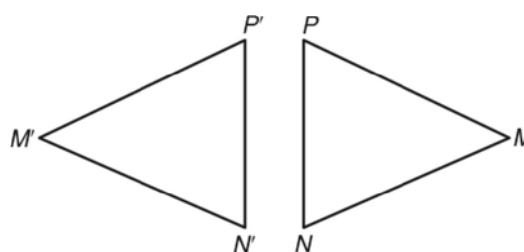
| Reflection   | Rotation   | Translation  |
|--|--|--|
|  <p><math>\triangle ABC \rightarrow \triangle A'B'C'</math></p> |  <p><math>\triangle JKL \rightarrow \triangle J'K'L'</math></p> |  <p><math>\triangle RST \rightarrow \triangle R'S'T'</math></p> |
| A figure is flipped over a line.   | A figure is turned around a fixed point.   | A figure is slid to a new position without turning.  |

Identify each transformation. Then use arrow notation to describe the transformation.

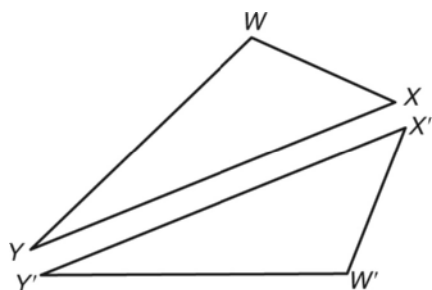
1.



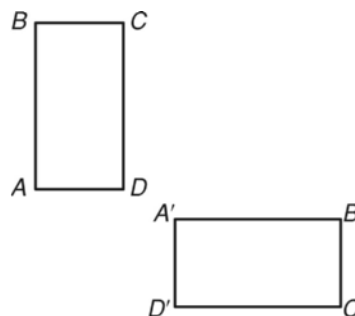
2.



3.



4.

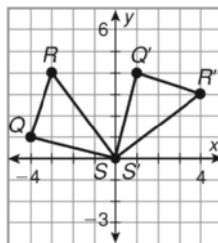


**LESSON**  
**1-7**

**Reteach**

**Transformations in the Coordinate Plane** *continued*

Triangle  $QRS$  has vertices at  $Q(-4, 1)$ ,  $R(-3, 4)$ , and  $S(0, 0)$ . After a transformation, the image has vertices at  $Q'(1, 4)$ ,  $R'(4, 3)$ , and  $S'(0, 0)$ . The transformation is a rotation.

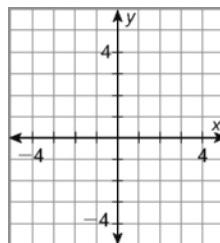


A translation can be described using a rule such as  $(x, y) \rightarrow (x + 4, y - 1)$ .

| Preimage   | Apply Rule         | Image       |
|------------|--------------------|-------------|
| $R(3, 5)$  | $R(3 + 4, 5 - 1)$  | $R'(7, 4)$  |
| $S(0, 1)$  | $S(0 + 4, 1 - 1)$  | $S'(4, 0)$  |
| $T(2, -1)$ | $T(2 + 4, -1 - 1)$ | $T'(6, -2)$ |

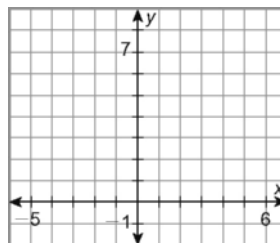
**Draw each figure and its image. Then identify the transformation.**

5. Triangle  $HJK$  has vertices at  $H(-3, -1)$ ,  $J(-3, 4)$ , and  $K(0, 0)$ . After a transformation, the image of the figure has vertices at  $H'(1, -3)$ ,  $J'(1, 2)$ , and  $K'(4, -2)$ .



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6. Triangle  $CDE$  has vertices at  $C(-4, 6)$ ,  $D(-1, 6)$ , and  $E(-2, 1)$ . After a transformation, the image of the figure has vertices at  $C'(4, 6)$ ,  $D'(1, 6)$ , and  $E'(2, 1)$ .



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**Find the coordinates for each image after the given translation.**

7. preimage:  $\triangle XYZ$  at  $X(-6, 1)$ ,  $Y(4, 0)$ ,  $Z(1, 3)$   
rule:  $(x, y) \rightarrow (x + 2, y + 5)$

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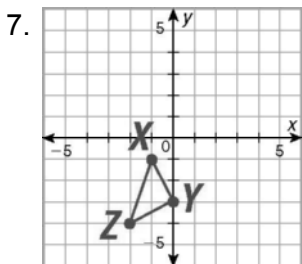
8. preimage:  $\triangle FGH$  at  $F(9, 8)$ ,  $G(-6, 1)$ ,  $H(-2, 4)$   
rule:  $(x, y) \rightarrow (x - 3, y + 1)$

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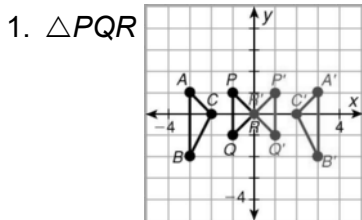
9. preimage:  $\triangle BCD$  at  $B(0, 2)$ ,  $C(-7, 1)$ ,  $D(1, 5)$   
rule:  $(x, y) \rightarrow (x + 7, y - 1)$

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- $G'(-2.5, 4), H'(-3.5, 2), I'(-4, 4), J'(-5, 6)$
- $(x, y) \rightarrow (x - 7, y + 5)$



### Practice C



- The vertex labels do not match. For the rotation,  $P$  moves to  $Q'$  and  $Q$  moves to  $P'$ .
- $\triangle ABC$  and  $\triangle PQR$
- $(-x, -y)$                       5.  $(y, -x)$
- $(-x, -y)$                       7.  $(x, y)$
- $(x, y) \rightarrow (x + \sqrt{3}, y + 1)$
- 120 meters

### Reteach

- translation; possible answer:  $\triangle FGH \rightarrow \triangle F'G'H'$
- reflection; possible answer:  $\triangle MNP \rightarrow \triangle M'N'P'$
- reflection; possible answer:  $\triangle WXY \rightarrow \triangle W'X'Y'$
- rotation; possible answer:  $\triangle ABCD \rightarrow \triangle A'B'C'D'$
- translation
- reflection
- $X'(-4, 6), Y'(6, 5), Z'(3, 8)$
- $F'(6, 9), G'(-9, 2), H'(-5, 5)$
- $B'(7, 1), C'(0, 0), D'(8, 4)$

### Challenge

- Possible answer: first, a reflection across the  $y$ -axis; then a translation 3 units right and 5 units down
- Possible answer: first, a reflection across the line  $y = 3$ ; then a translation 8 units left and 4 units down.
- $W(-7, -5), X'(-3, -5), Y'(-4, -2), Z'(-6, -2)$ ; preimage reflected across  $x$ -axis; image translated by  $(x, y) \rightarrow (x + 8, y + 3)$
- No, the coordinates could be  $W'(1, 8), X'(5, 8), Y'(4, 5), Z'(2, 5)$ .

### Problem Solving

- player 3:  $(x, y) \rightarrow (x + 4.5, y - 1)$ ;  
player 4:  $(x, y) \rightarrow (x - 4, y + 1)$
- player 3:  $(-5.5, -2)$ ; player 4:  $(4, -1.5)$
- $(-5, 9), \left(\frac{1}{2}, 9\right), (-1, 6), \left(-3\frac{1}{2}, 6\right)$
- reflection across the  $y$ -axis
- $A'(6, 17), C'(10, 14), D'\left(-7\frac{1}{2}, 14\right)$
- C                                      7. J

### Reading Strategies

- Possible answer: translation
- Possible answer: rotation
- reflection

### LESSON 2-1

#### Practice A

- 10                                      2. W
- summer
- inductive reasoning
- true                                      6. even
- $n$
- The number of rings in a tree is the same as the tree's age.
- 82 rings                                      10. false
- Possible answers: zero, any negative number