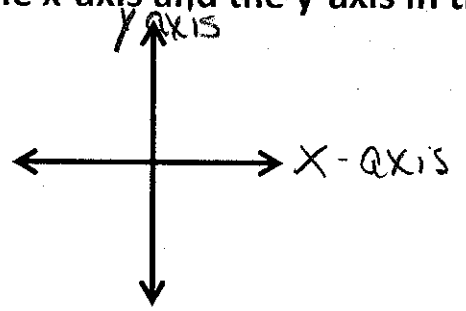
February 18, 2014

# 9.1 Warm-Up

**1. Identify the x-axis and the y-axis in the image below.**




**2. Describe a reflection.**

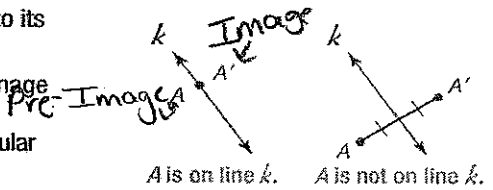
# 9.1 Reflections

**Target:** Use properties of the coordinate plane to identify reflections

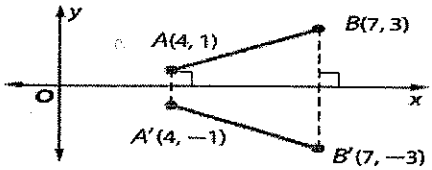
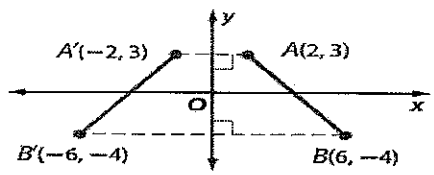
**KeyConcept Reflection in a Line**

A reflection in a line is a function that maps a point to its image such that

- if the point is on the line, then the image and preimage are the same point, or
- if the point is not on the line, the line is the perpendicular bisector of the segment joining the two points.




**KeyConcept Reflection in the *x*- or *y*-axis**

| Reflection in the *x*-axis | Reflection in the *y*-axis |
|---|---|
| **Words** To reflect a point in the *x*-axis, multiply its *y*-coordinate by −1. | **Words** To reflect a point in the *y*-axis, multiply its *x*-coordinate by −1. |
| **Symbols** $(x, y) \rightarrow (x, -y)$ | **Symbols** $(x, y) \rightarrow (-x, y)$ |
| **Example**  | **Example**  |





X-axis

1. x- stays the same
2. y goes opposite

Y-axis

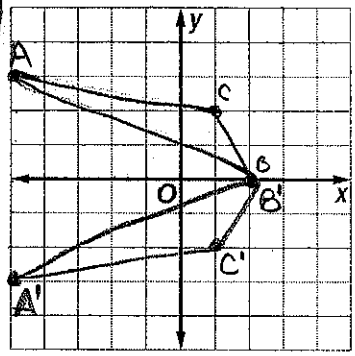
1. y stays the same
2. x goes opposite

## Example 4 Reflect a Figure in the *x*- or *y*-axis

**Graph each figure and its image under the given reflection.**

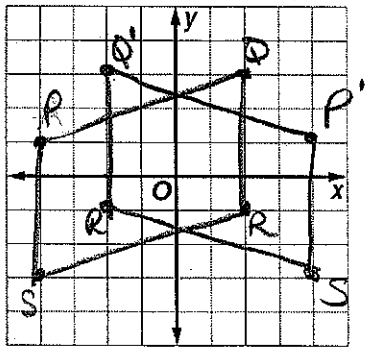
**a.** $\triangle ABC$ with vertices $A(-5, 3)$, $B(2, 0)$, and $C(1, 2)$ in the *x*-axis

A (-5,3) A' (-5,-3)
B (2,0) B' (2, 0)
C (1,2) C' (1, -2)




**b.** parallelogram *PQRS* with vertices $P(-4, 1)$, $Q(2, 3)$, $R(2, -1)$, and $S(-4, -3)$ in the *y*-axis

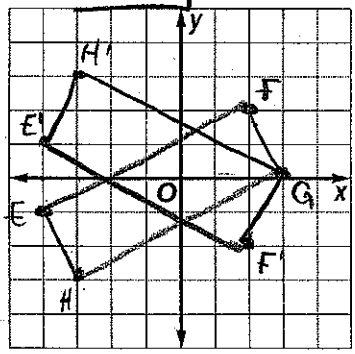
P (-4, 1) P' (4, 1)
Q (2,3) Q' (-2,3)
R (2,-1) R' (-2,-1)
S (-4,-3) S' (-4,-3)




### GuidedPractice

**4A.** rectangle with vertices $E(-4, -1)$, $F(2, 2)$, $G(3, 0)$, and $H(-3, -3)$ in the *x*-axis

E (-4,-1) E' (-4,1)
F (2,2) F' (2,-2)
G (3,0) G' (3,0)
H (-3,-3) H (-3,3)




**4B.** $\triangle JKL$ with vertices $J(3, 2)$, $K(2, -2)$, and $L(4, -5)$ in the *y*-axis

J (3,2) J' (-3,2)
K (2,-2) K' (-2,-2)
L (4,-5) L' (-4,-5)