4.2.1 Reflections

Tuesday, September 5, 2017 1:18 PM

What You Will Learn

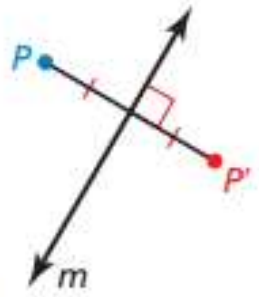
- Perform reflections.

Reflections

A **reflection** is a transformation that uses a line like a mirror to reflect a figure. The mirror line is called the **line of reflection**.

A reflection in a line m maps every point P in the plane to a point P', so that for each point one of the following properties is true.

- If P is not on m, then m is the perpendicular bisector of $\overline{PP'}$, or
- If P is on m, then $P = P'$.

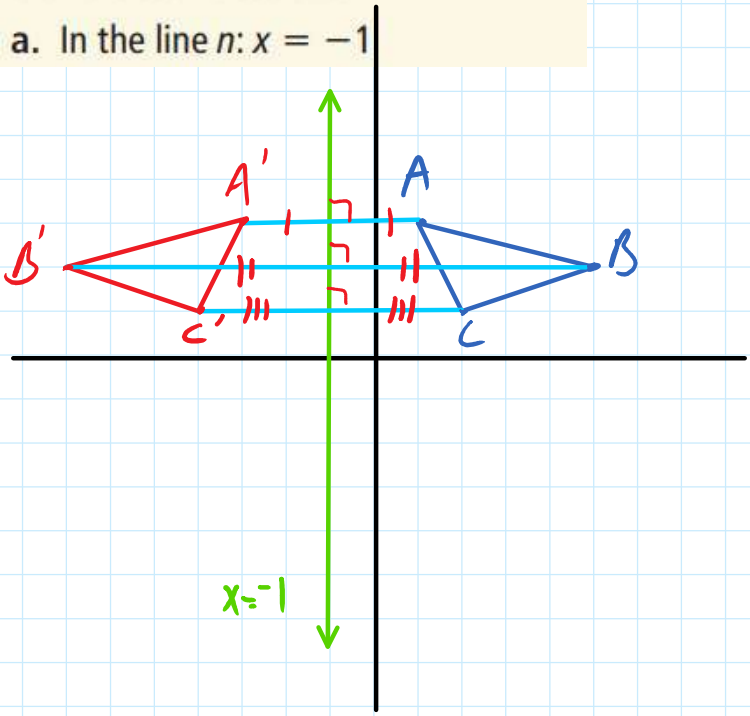


point P not on m

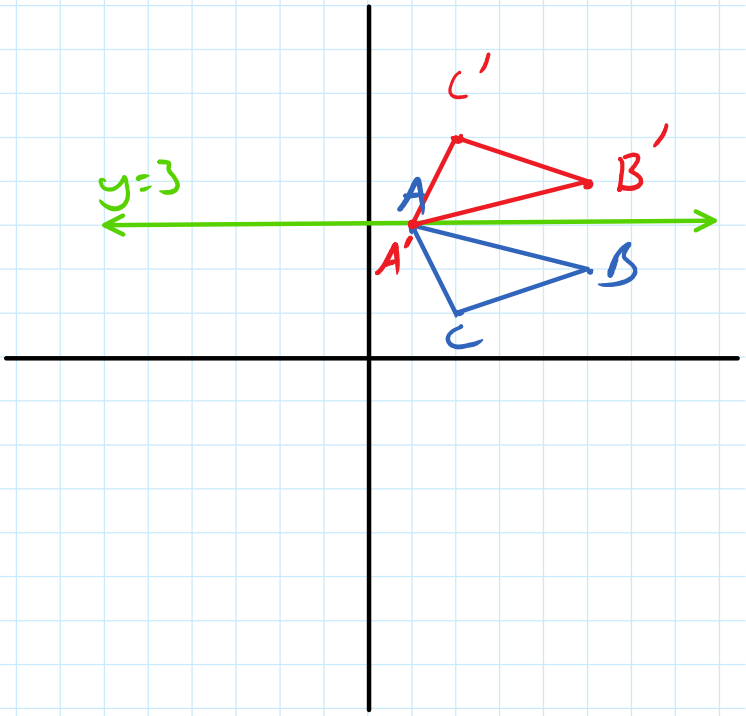
point P on m

Graph $\triangle ABC$ with vertices $A(1, 3)$, $B(5, 2)$, and $C(2, 1)$ and its image after the reflection described.

a. In the line n: $x = -1$



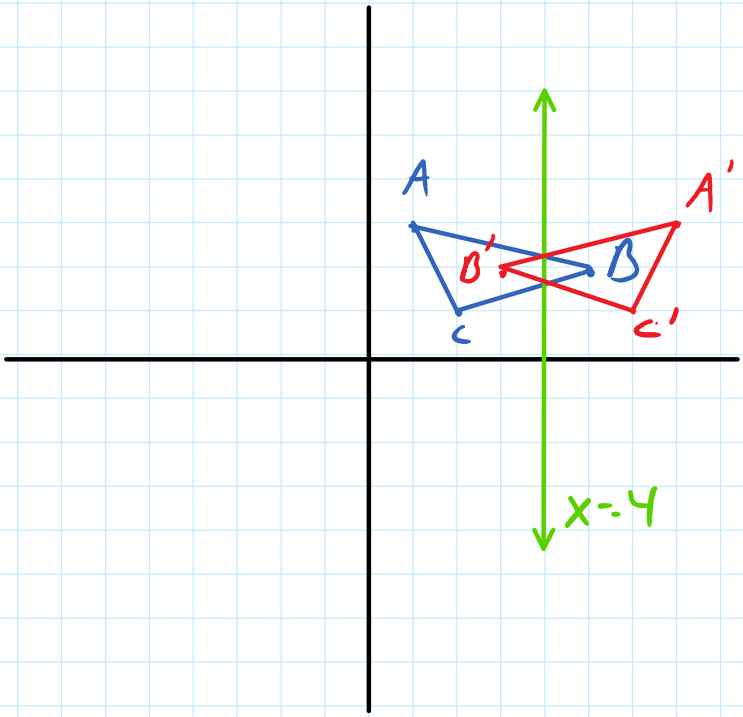
b. In the line m: $y = 3$

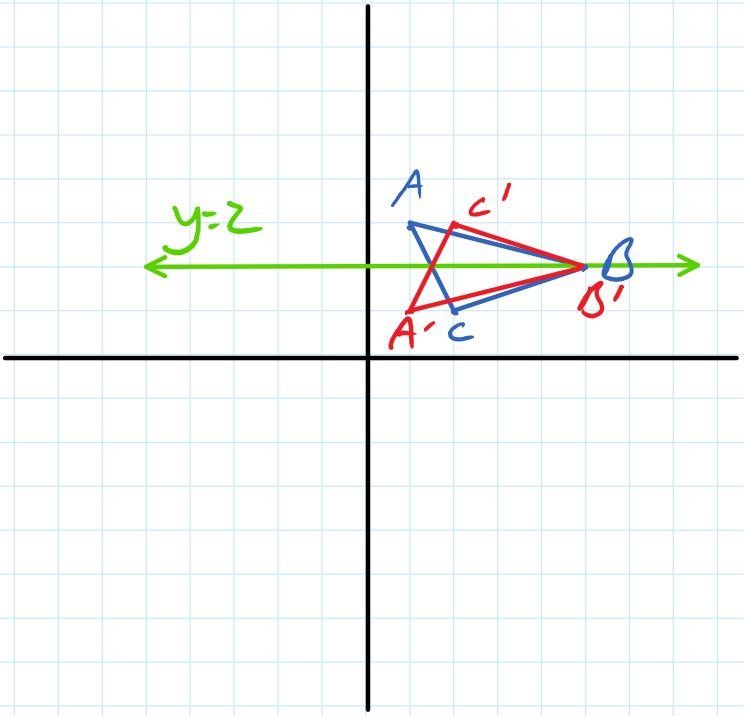


Graph triangle ABC with vertices A(1,3), B(5,2), and C(2,1) and its image after the reflection described

1. $x = 4$

3. $y = 2$



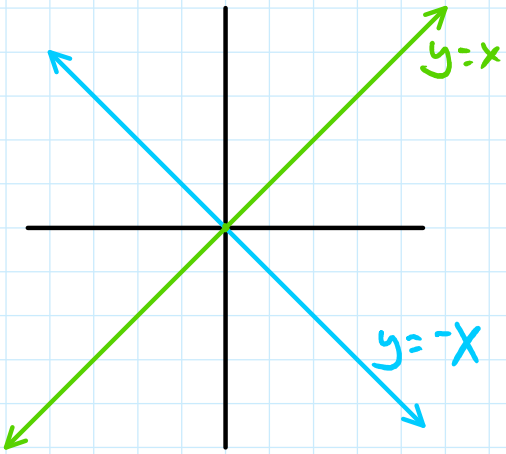


Coordinate Rules for Reflections

- If (a, b) is reflected in the x-axis, then its image is the point $(a, -b)$.
- If (a, b) is reflected in the y-axis, then its image is the point $(-a, b)$.
- If (a, b) is reflected in the line $y = x$, then its image is the point (b, a).
- If (a, b) is reflected in the line $y = -x$, then its image is the point $(-b, -a)$.

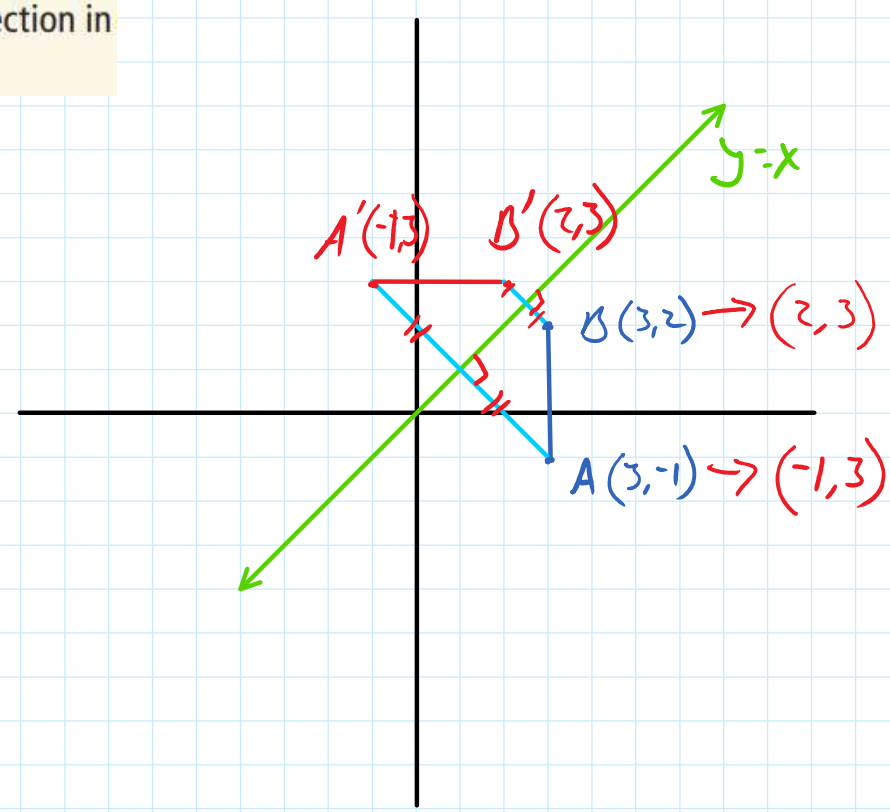
y=x

y=mx+b



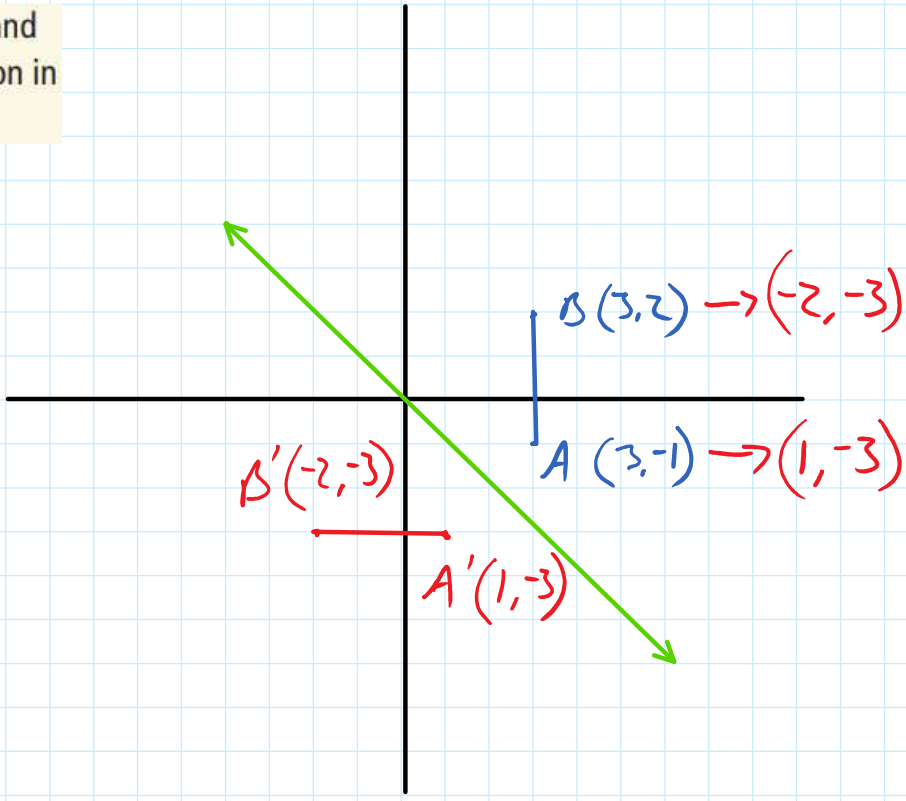
Graph $\overline{AB}$ with endpoints $A(3, -1)$ and $B(3, 2)$ and its image after a reflection in the line $y = x$.

$(a,b) \to (b,a)$



Graph $\overline{AB}$ with endpoints $A(3, -1)$ and $B(3, 2)$ and its image after a reflection in the line $y = -x$.

$(a,b) \to (-b,-a)$



Practice *sec 4.1* **pg. 186: 2, 3-15EO**