Reflections

Lesson 6.2
Vocabulary:

**Reflection** - a mirror image of the original figure

**Line of Reflection** - the line over which a figure is reflected
Over the x-axis:

To reflect a figure over the x-axis, multiply the y-coordinates by $-1$.

$$(x, y) \rightarrow (x, -y)$$
Over the y-axis:

To reflect a figure over the y-axis, multiply the x-coordinates by $-1$.

$$(x, y) \rightarrow (-x, y)$$
1. Triangle $ABC$ has vertices $A(5, 2), B(1, 3),$ and $C(-1, 1)$. Graph the figure and its reflected image over the $x$-axis. Then find the coordinates of the vertices of the reflected image.

The $x$-axis is the line of reflection. So, plot each vertex of $A'B'C'$ the same distance from the $x$-axis as its corresponding vertex on $ABC$.

Point $A$ is 2 units above the $x$-axis, ...

... so point $A'$ is plotted 2 units below the $x$-axis.

The coordinates are $A'(5, -2), B'(1, -3),$ and $C'(-1, -1)$.
2. Quadrilateral $KLMN$ has vertices $K(2, 3)$, $L(5, 1)$, $M(4, -2)$, and $N(1, -1)$. Graph the figure and its reflection over the $y$-axis. Then find the coordinates of the vertices of the reflected image.

The $y$-axis is the line of reflection. So, plot each vertex of $K'L'M'N'$ the same distance from the $y$-axis as its corresponding vertex on $KLMN$.

The coordinates are $K'(-2, 3)$, $L'(-5, 1)$, $M'(-4, -2)$, and $N'(-1, -1)$. 
a. Triangle $PQR$ has vertices $P(1, 5)$, $Q(3, 7)$, and $R(4, -1)$. Graph the figure and its reflection over the $y$-axis. Then find the coordinates of the reflected image.

$P'(-1, 5)$, $Q'(-3, 7)$, $R'(-4, -1)$
Graph \( \triangle ABC \) with vertices \( A(5, 1) \), \( B(1, 2) \), and \( C(6, 2) \) and its reflection over the \( x \)-axis. Then find the coordinates of the image.

\[ A'(5, -1), \ B'(1, -2), \ C'(6, -2) \]
square $ABCD$ with vertices $A(2, 4)$, $B(-2, 4)$, $C(-2, 8)$, and $D(2, 8)$ over the $x$-axis

$A'(2, -4)$, $B'(-2, -4)$, $C'(-2, -8)$, $D'(2, -8)$
Got It? Do this problem to find out.

parallelogram $HIJK$ with vertices $H(-1, 3)$, $I(-1, -1)$, $J(2, -2)$, and $K(2, 2)$ over the y-axis

$H'(1, 3)$, $I'(1, -1)$, $J'(-2, -2)$, $K'(-2, 2)$
3. The figure below is reflected over the y-axis. Find the coordinates of point $A'$ and point $B'$. Then sketch the figure and its image on the coordinate plane.

Point $A$ is located at $(1, 4)$. Point $B$ is located at $(2, 1)$. Since the figure is being reflected over the y-axis, multiply the $x$-coordinates by $-1$.

- $A(1, 4) \rightarrow A'(-1, 4)$
- $B(2, 1) \rightarrow B'(-2, 1)$
b. The figure at the right is reflected over the x-axis. Find the coordinates of point $A'$ and point $B'$. Then sketch the image on the coordinate plane.

\[ (x, y) \rightarrow (x, -y) \]

$A (-2, 2) \rightarrow A'(-2, -2)$

$B (2, 2) \rightarrow B'(2, -2)$
The figure is reflected over the y-axis. Find the coordinates of point $A'$ and point $B'$. Then sketch the image on the coordinate plane. (Example 3)

$$(x, y) \rightarrow (-x, y)$$

$A (0, 5) \rightarrow A'(0, 5)$

$B (2, 4) \rightarrow B'(-2, 4)$
Homework:

Pg. 465-468

# 1-7 (all), #13-25 (odds)