Students will identify and model distance, midpoint, and segment bisector.
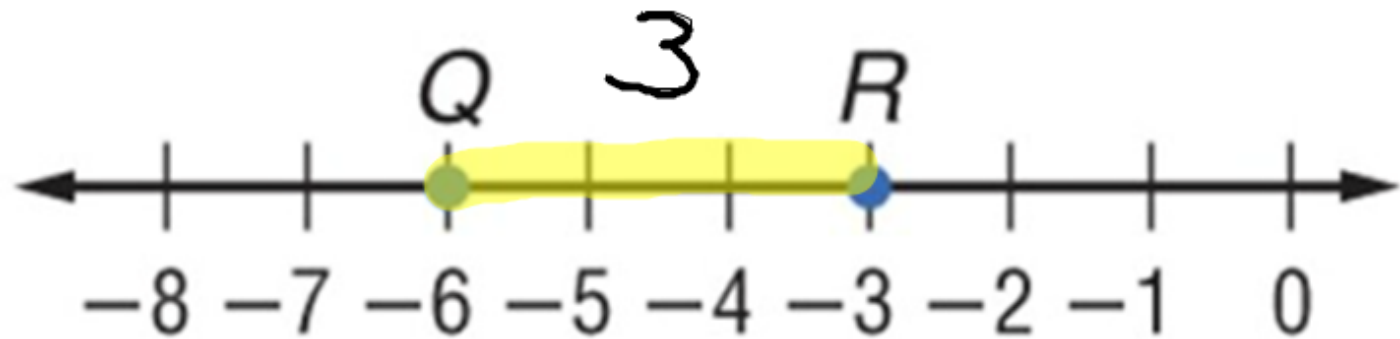
Students will find the midpoint on a line segment and the distance between two points.

Distance.....

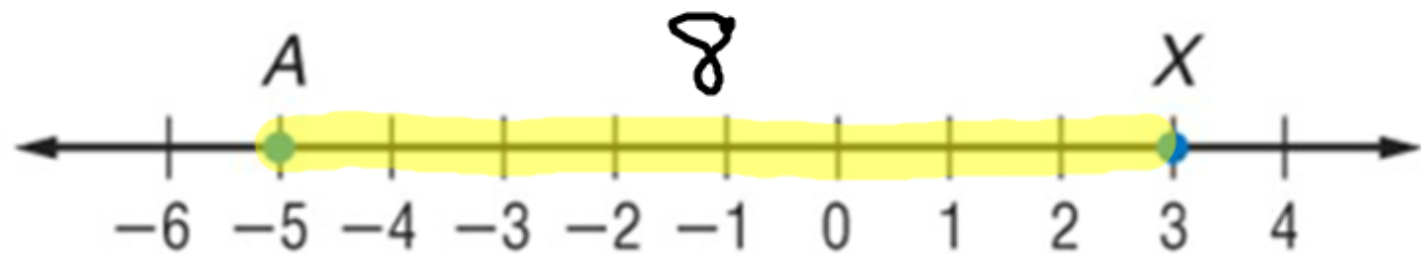length of the segment connecting the two points

can never be negative

Use the number line to find *QR*.

Q 3 R

$-8\ -7\ -6\ -5\ -4\ -3\ -2\ -1\ \ 0$

$|-6-(-3)|$

$|-3|=3$

$-3-(-6)$

3

Use the number line to find *AX*

A 8 X

$-6\ -5\ -4\ -3\ -2\ -1\ \ 0\ \ 1\ \ 2\ \ 3\ \ 4$

$|-5-3|$

$|-8|$

8

$|3-(-5)|$

$|8|$

8

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

Q (x_2, y_2)

P (x_1, y_1)

O

y

x

Find the distance between $E(-4, 1)$ and $F(3, -1)$.

$$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

$$x_1 \quad y_1 \qquad\qquad x_2 \quad y_2$$

$$d = \sqrt{(3 + (+4))^2 + (-1 - 1)^2}$$

$$d = \sqrt{(7)^2 + (-2)^2}$$

$$d = \sqrt{49 + 4}$$

$$d \approx \sqrt{53} \approx 7.3$$

Find the distance between $A(-3, 4)$ and $M(1, 2)$.

$$x_2 \quad y_2 \qquad\qquad x_1 \quad y_1$$

$$d = \sqrt{(-3-1)^2 + (4-2)^2}$$

$$d = \sqrt{(-4)^2 + (2)^2}$$

$$d = \sqrt{16 + 4}$$

$$d = \sqrt{20} \approx 4.5$$

Midpoint — halfway btwn 2 pts

Find the midpoint of *AX*
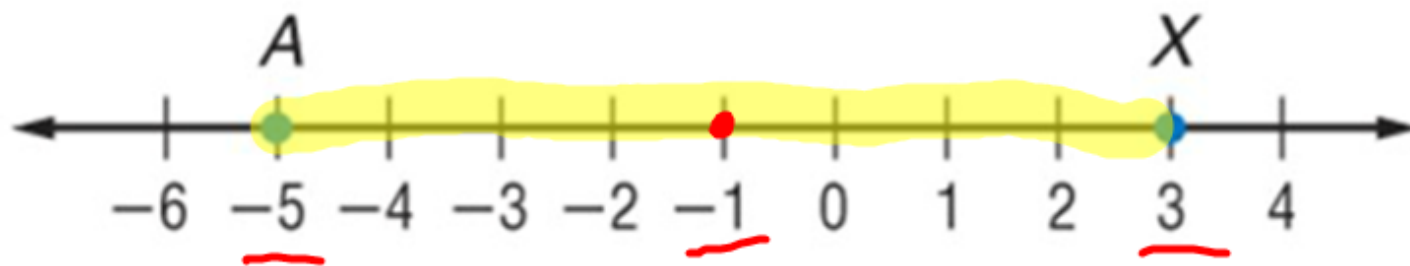
$$\frac{-5 + 3}{2} = \frac{-2}{2} = -1$$

Find the coordinates of M, the midpoint of $\overline{GH}$, for $G(\overset{x_1}{8}, \overset{y_1}{-6})$, and $H(\overset{x_2}{-14}, \overset{y_2}{12})$.

$$\left(\frac{8 + {}^-14}{2} , \frac{-6 + 12}{2} \right)$$
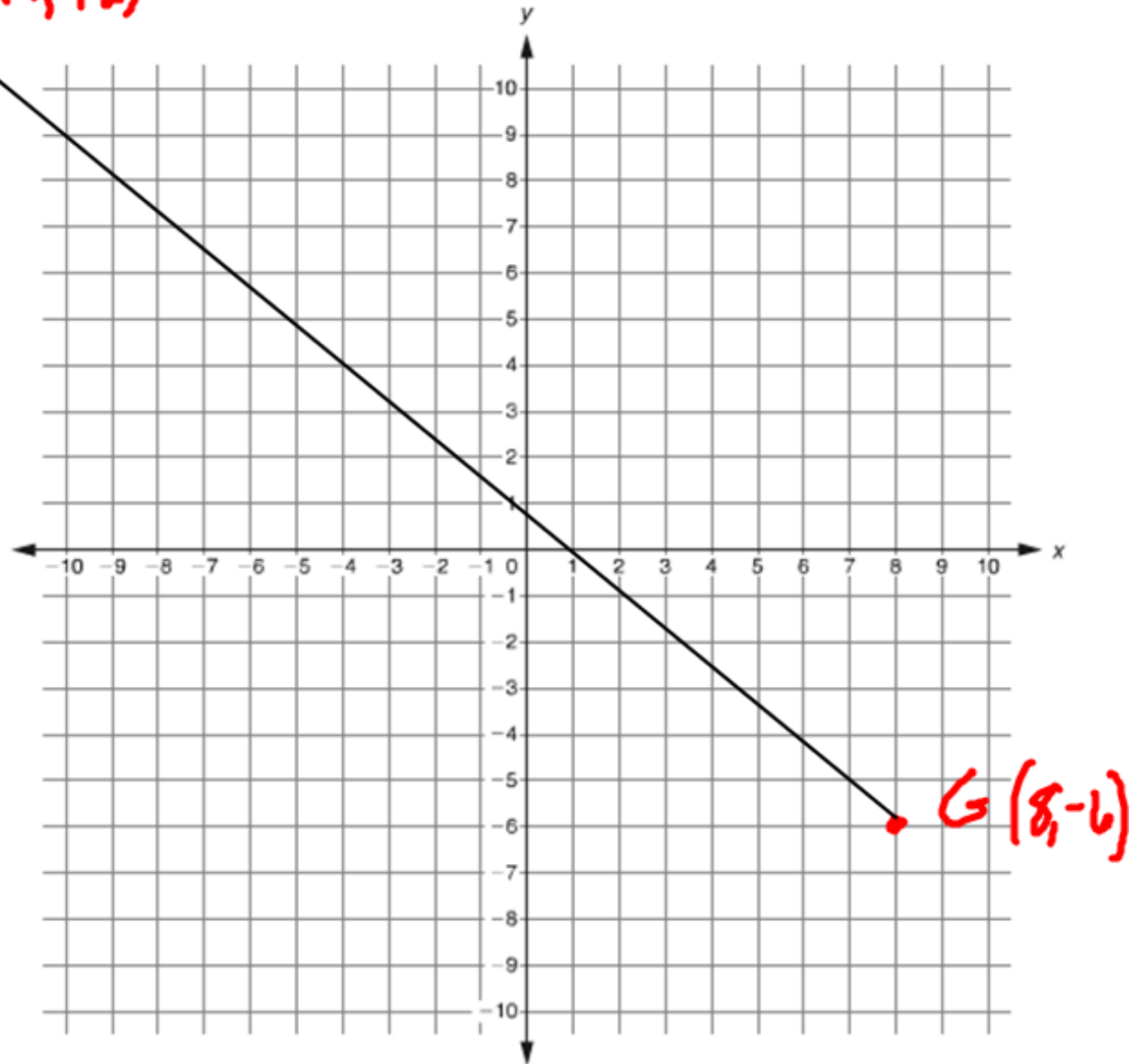
$$\left(\frac{-6}{2} , \frac{6}{2} \right)$$

$$\left(-3 , 3 \right)$$

Midpoint Formula (in Coordinate Plane)

Midpoint Formula

$$\left(\frac{x_1 + x_2}{2}, \quad \frac{y_1 + y_2}{2} \right)$$

$H(-14, 12)$

$G(8, -6)$

Find the coordinates of the midpoint of $\overline{XY}$ for $X(-2, 3)$, and $Y(-8, -9)$.

$$\left(\frac{-2 + -8}{2}, \frac{3 + -9}{2} \right)$$

$$\left(\frac{-10}{2}, \frac{-6}{2} \right)$$

$$(-5, -3)$$

$X(-2, 3)$

$M(-5, -3)$

$Y(-8, -9)$