

What are the coordinates of the point  $\frac{3}{5}$  of the way from A to B?

**SOLUTION**

Difference x-values

$$13 - 3 = 10$$

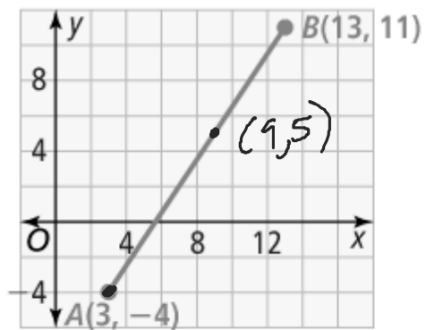
Difference of y-values

$$11 - (-4) = 15$$

$$10\left(\frac{3}{5}\right) = 6 \quad 15\left(\frac{3}{5}\right) = 9$$

$$\text{x-value } 3 + 6 = 9$$

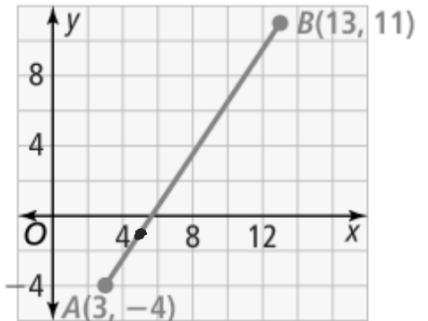
$$\text{y-values } -4 + 9 = 5$$



(9, 5)

2. Find the coordinates of each point described.

a.  $\left(\frac{7}{10}\right)$  of the way from A to B.



Enter your answer:

$$\left. \begin{array}{l} \text{Difference of } x = 13 - 3 = 10 \\ \text{Difference of } y = 11 - (-4) = 15 \end{array} \right\}$$

$$(10)\left(\frac{7}{10}\right) = 7 \quad (15)\left(\frac{7}{10}\right) = 10.5$$

$$7 + 3 = 10$$

$$10.5 + (-4) = 6.5$$

$$(10, 6.5)$$

b.  $\frac{4}{5}$  of the way from B to A.

Enter your answer:

$$\begin{array}{l} \text{Difference of } x = 10 \\ \text{Difference of } y = 15 \end{array}$$

$$\left(\frac{4}{5}\right)(10) = 8$$

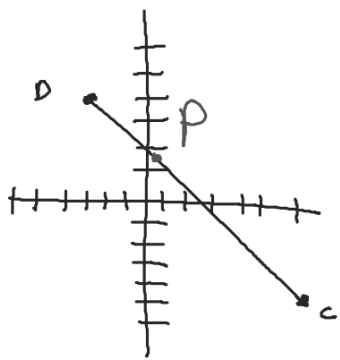
$$\left(\frac{4}{5}\right)(15) = 12$$

$$13 - 8$$

$$11 - 12$$

$$(5, -1)$$

Find the coordinates of point P that is  $\frac{3}{4}$  of the way along the directed line segment from C (6, -5) to D (-3, 4).



$$\text{Difference of } x = 6 - (-3) = 9$$

$$\text{Difference of } y = -5 - 4 = -9$$

$$9\left(\frac{3}{4}\right) = 6.75 \quad -9\left(\frac{3}{4}\right) = -6.75$$

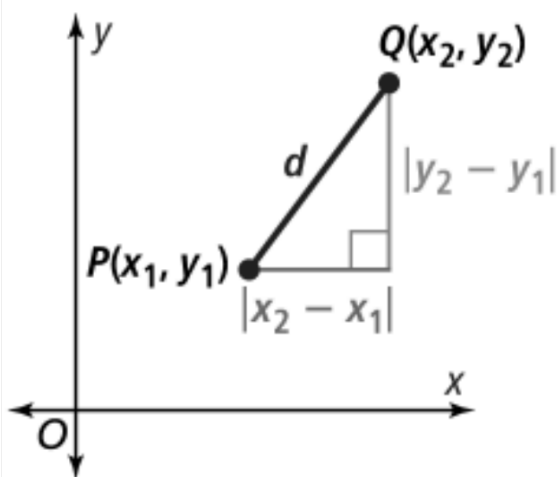
$$6 - 6.75 \quad -5 - (-6.75)$$
$$.75 \quad 1.75$$

$$(.75, 1.75)$$

Find the coordinates of point Q that is  $\frac{2}{3}$  of the way along the directed segment from R (-7, -2) to S (2, 4).

How can you find the distance between  
 $P(x_1, y_1)$  and  $Q(x_2, y_2)$  on the coordinate  
plane?

*Always  
positive*



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

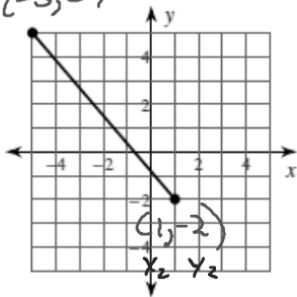
## Distance Formula

The distance  $d$  between two points  $P(x_1, y_1)$  and  $Q(x_2, y_2)$  is:

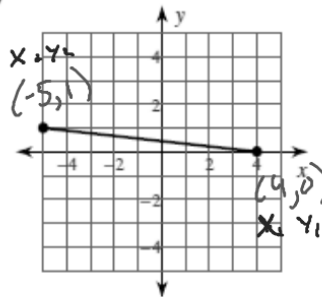
$$d(P, Q) = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

Find the distance between each pair of points. Round your answer to the nearest tenth, if necessary.

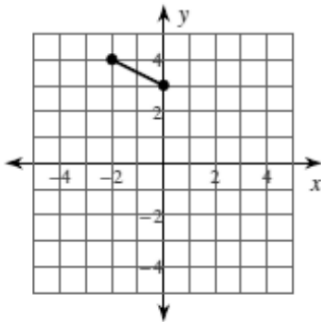
1)  $(-5, 5)$



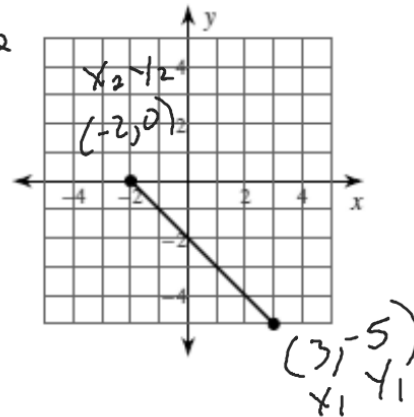
$$\begin{aligned}
 d &= \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} \\
 &= \sqrt{(1 - (-5))^2 + (-2 - 5)^2} \\
 &= \sqrt{6^2 + (-7)^2} \\
 &= \sqrt{36 + 49} \\
 &= \sqrt{85}
 \end{aligned}$$



$$\begin{aligned}
 d &= \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} \\
 &= \sqrt{(-5 - 4)^2 + (1 - 0)^2} \\
 &= \sqrt{(-9)^2 + (1)^2} \\
 &= \sqrt{81 + 1} \\
 &= \sqrt{82}
 \end{aligned}$$



$$\begin{aligned}
 d &= \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} \\
 &= \sqrt{(-2 - 0)^2 + (3 - (-5))^2} \\
 &= \sqrt{(-2)^2 + (8)^2} \\
 &= \sqrt{4 + 64} \\
 &= \sqrt{68}
 \end{aligned}$$



$$\begin{aligned}
 d &= \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2} \\
 &= \sqrt{(-2 - 3)^2 + (0 - (-5))^2} \\
 &= \sqrt{(-5)^2 + (5)^2} \\
 &= \sqrt{25 + 25} \\
 &= \sqrt{50}
 \end{aligned}$$

Find the distance between each pair of points. Round your answer to the nearest tenth, if necessary.

7)  $(-2, 3), (-7, -7)$

$$\begin{aligned}d &= \sqrt{(-7 - (-2))^2 + (-7 - 3)^2} \\&= \sqrt{(-5)^2 + (-10)^2} \\&= \sqrt{25 + 100} \\&= \sqrt{125}\end{aligned}$$

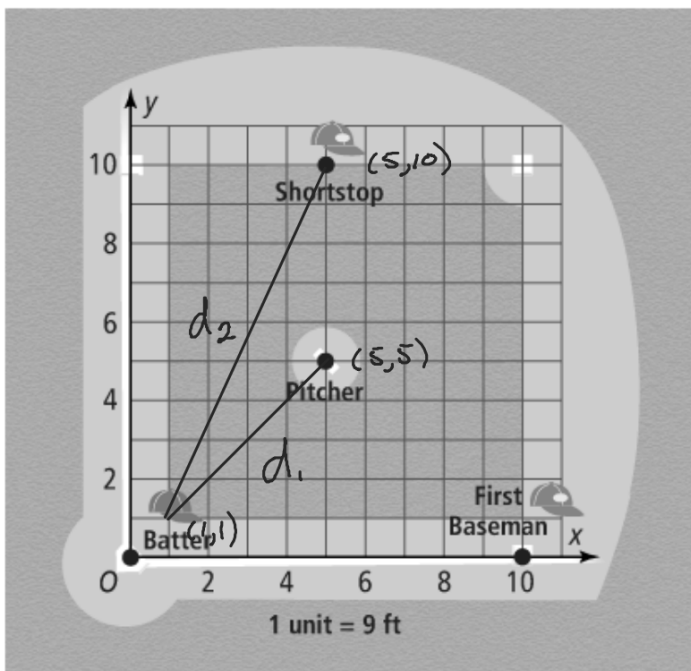
$(-10, -7), (-8, 1)$

8)  $(2, -9), (-1, 4)$

$$\begin{aligned}&= \sqrt{(-1 - 2)^2 + (4 - (-9))^2} \\&= \sqrt{(-3)^2 + (13)^2} \\&= \sqrt{9 + 169} \\&= \sqrt{178}\end{aligned}$$

12)  $(-6, -10), (-2, -10)$

A pitcher throws a ball to a batter, who hits the ball to the shortstop. If the ball travels in a straight line between each, what is the total distance traveled by the ball? Round your answer to the nearest tenth of a foot.



$$d_1 = \sqrt{(5-1)^2 + (5-1)^2}$$

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

$$= \sqrt{16 + 16} = \sqrt{32}$$

$$d_2 = \sqrt{(5-1)^2 + (10-1)^2}$$

$$= \sqrt{4^2 + 9^2}$$

$$= \sqrt{16 + 81} = \sqrt{97}$$

$$\sqrt{32} + \sqrt{97} = 15.5$$