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

SOLUTION

Difference x-values

$13 - 3 = 10$

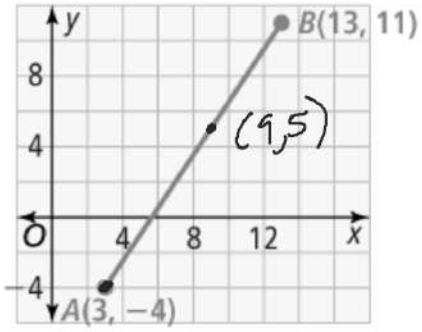
Difference of y-values

$11 - (-4) = 15$

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

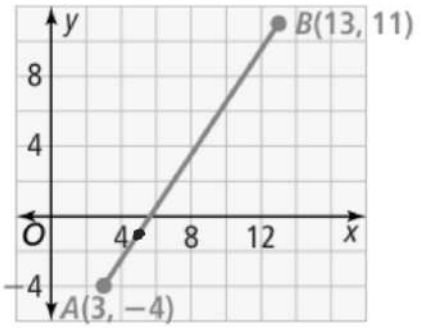
x-value $3 + 6 = 9$

y-values $-4 + 9 \quad 5$



(9,5)

2. Find the coordinates of each point described.



a. $\frac{7}{10}$ of the way from *A* to *B*.

Difference of x = 13 − 3 = 10
Difference of y = 11 − (−4) = 15
x $(10)\left(\frac{7}{10}\right) = 7$
y $(15)\left(\frac{7}{10}\right) = 10.5$

$7 + 3 = 10$
$10.5 + (-4) = 6.5$
$(10, 6.5)$

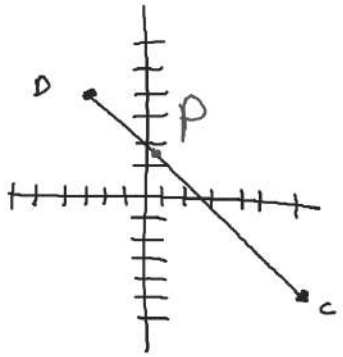
b. $\frac{4}{5}$ of the way from *B* to *A*.

Difference of x = 10
Difference of y = 15

$\left(\frac{4}{5}\right)(10) = 8$
$13 - 8$
$(5, -1)$

$\left(\frac{4}{5}\right)(15) = 12$
$11 - 12$

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).



Difference of x = $6-(-3)=9$

Difference of y = $-5-4=-9$

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

$6-6.75$ $\quad -5-(-6.75)$

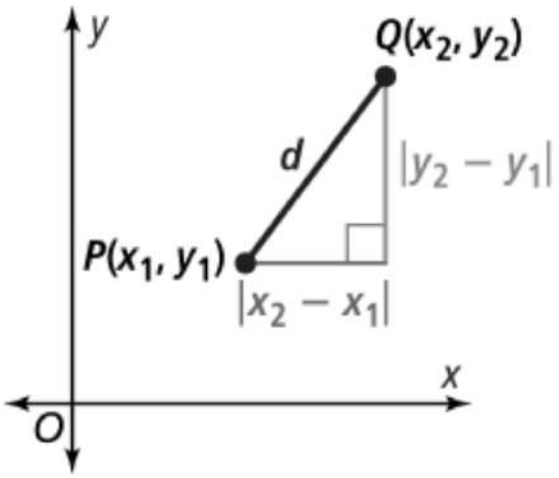
$.75$ $\quad 1.75$

$(.75, 1.75)$

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



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

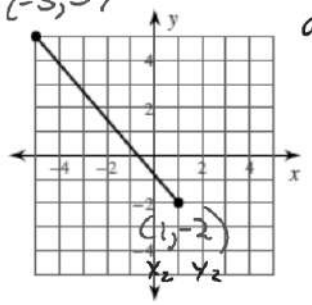
Distance Formula

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) $(-5,5)$ $(1,-2)$



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

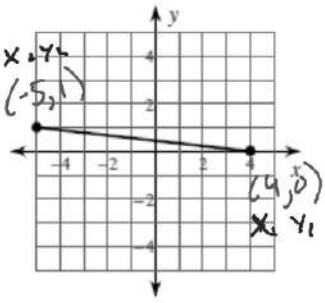
$= \sqrt{(1-(-5))^2+(-2-5)^2}$

$= \sqrt{(6)^2+(-7)^2}$

$\sqrt{36+49}$

$\sqrt{85}$

2) $(-5,1)$ $(4,0)$



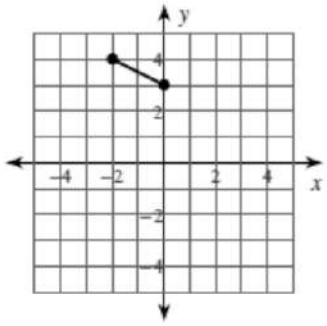
$d = \sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$

$= \sqrt{(-5-4)^2+(1-0)^2}$

$= \sqrt{(-9)^2+(1)^2}$

$= \sqrt{81+1}$

$= \sqrt{82}$



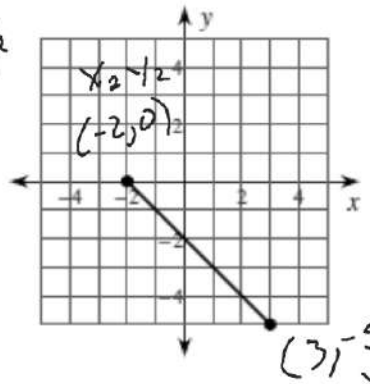
$d = \sqrt{(x_2-x_1)^2+(y_2-y_1)^2}$

$= \sqrt{(-2-3)^2+(0-(-5))^2}$

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

$\sqrt{25+25}$

$\sqrt{50}$



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

7) (–2, 3), (–7, –7)

$d = \sqrt{(-7-(-2))^2 + (-7-3)^2}$

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

$\sqrt{25 + 100}$

$\sqrt{125}$

8) (2, –9), (–1, 4)

$\sqrt{(-1-2)^2 + (4-(-9))^2}$

$\sqrt{(-3)^2 + (13)^2}$

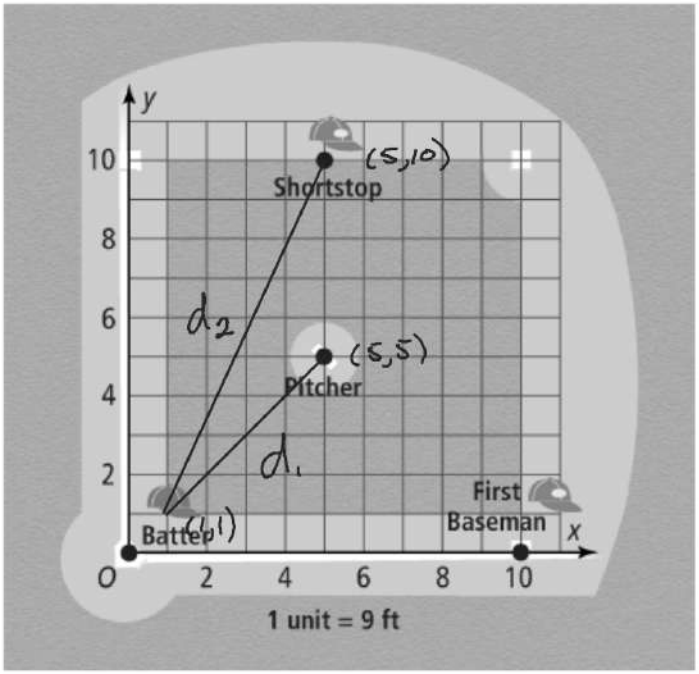
$\sqrt{9 + 169}$

$\sqrt{178}$

(–10, –7), (–8, 1)

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 <u>total distance</u> traveled by the ball? Round your answer to the nearest tenth of a foot.



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

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

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

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

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

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

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