

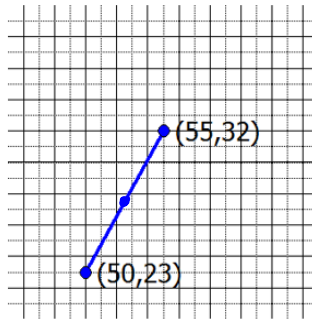
Finding the midpoint:

mean of the x's and y's

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

coordinate

Find the midpoint



$$\left(\frac{50+55}{2}, \frac{23+32}{2} \right)$$

$$= \left(\frac{105}{2}, \frac{55}{2} \right)$$

$$= (52.5, 27.5)$$

Finding the slope (m)

$$\frac{\Delta y}{\Delta x}$$

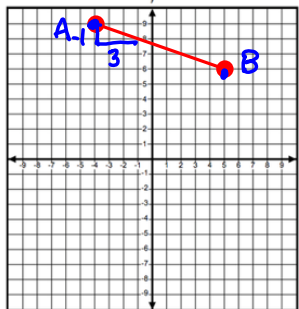
rise
run

$$\text{Slope: } m = \frac{y_2 - y_1}{x_2 - x_1}$$

$$m = \frac{6-9}{5-4}$$

$$= \frac{-3}{1}$$

Find slope of line through $A(x_1, y_1)$ and $B(x_2, y_2)$ $\frac{\Delta y}{\Delta x} = \frac{-3}{1} = -\frac{1}{3}$



Slope of AB = $-\frac{1}{3}$

The slope of a line parallel to AB is $-\frac{1}{3}$ because it is the same

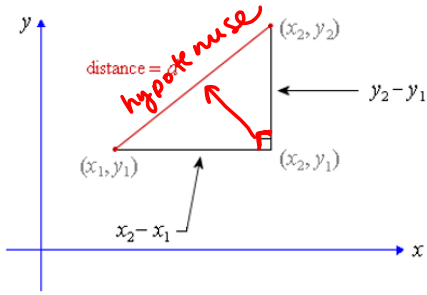
The slope of a line perpendicular to AB is 3 because it is the negative reciprocal

ex.

$$\frac{2}{3} \rightarrow -\frac{3}{2}$$

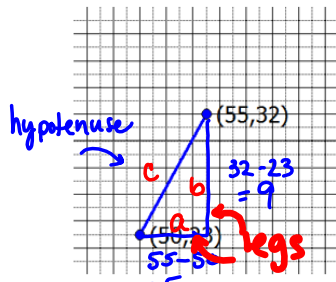
$$-\frac{4}{1} \rightarrow \frac{1}{4}$$

Distance Formula:



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

Find the distance between the two points



leg² + leg² = hyp.²
 $5^2 + 9^2 = c^2$
 $25 + 81 = c^2$
 $\sqrt{106} = \sqrt{c^2}$
 $10.3 \approx c$

10.3 units

x_1, y_1 x_2, y_2
 (-4, 9) and (5, 6)

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

$$d = \sqrt{(5 - (-4))^2 + (6 - 9)^2}$$

$$d = \sqrt{(9)^2 + (-3)^2}$$

$$d = \sqrt{81 + 9}$$

$$d = \sqrt{90} \quad d \approx 9.5 \text{ units}$$

$$d = \sqrt{9 \cdot 10}$$

$$d = \sqrt{9} \cdot \sqrt{10}$$

$$d = 3\sqrt{10} \text{ units}$$

B-level