

Name: Notes - Key

# Distance and Midpoint Instruction

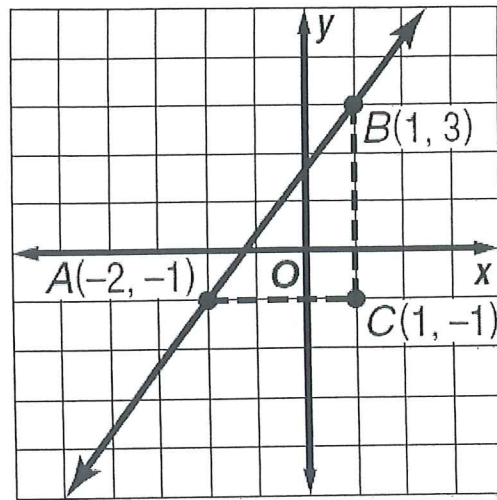
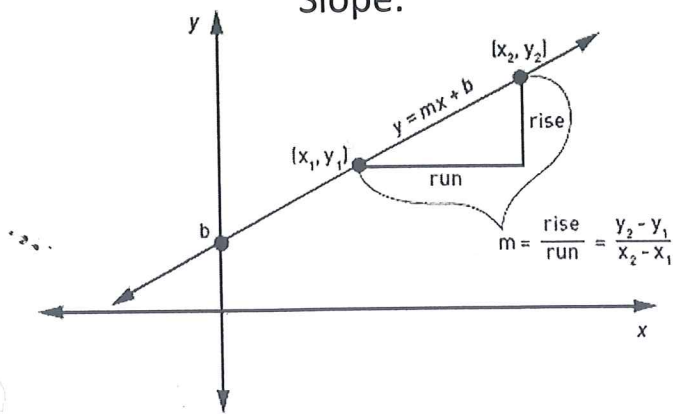
Pythagorean Theorem:

$$a^2 + b^2 = c^2$$

Distance Formula:

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

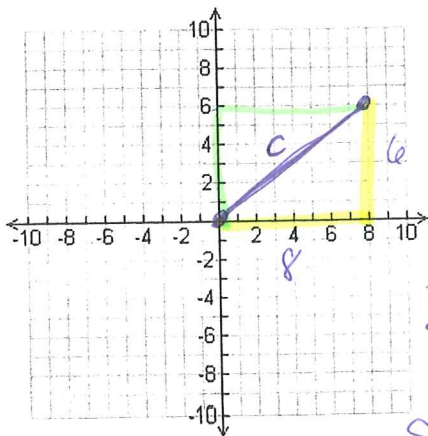
Slope:



## Let's Practice!

**Directions:** Use the Pythagorean Theorem or Distance Formula to find the distance of each then find the slope.

1.  $A(0,0), B(8,6)$



$$a^2 + b^2 = c^2$$

$$6^2 + 8^2 = c^2$$

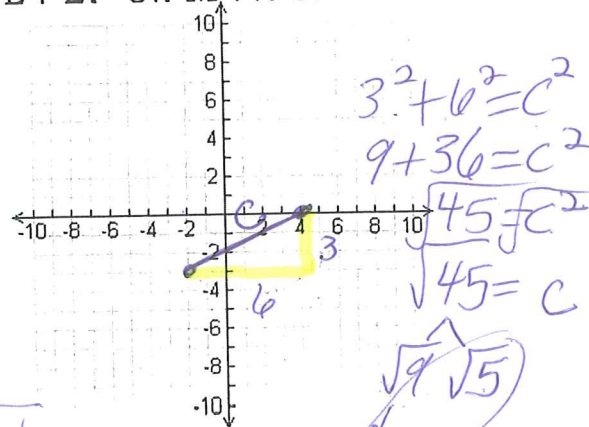
$$36 + 64 = c^2$$

$$\sqrt{100} = \sqrt{c^2}$$

Dist  $10 = c$

Slope  $\frac{\text{rise}}{\text{run}} = \frac{6}{8} = \frac{3}{4}$

2.  $L(-2, -3), M(4, 0)$



$$3^2 + 6^2 = c^2$$

$$9 + 36 = c^2$$

$$\sqrt{45} = \sqrt{c^2}$$

$$\sqrt{45} = c$$

Dist  $3\sqrt{5} = c$

Slope  $\frac{3}{6} = \frac{1}{2}$

## Distance and Midpoint Instruction Continued

Midpoint on a  
Coordinate Plane

If a segment has endpoints with coordinates  $(x_1, y_1)$  and  $(x_2, y_2)$ ,  
then the coordinates of the midpoint of the segment are  $\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$ .

**Directions: Find the coordinates of the midpoint M of  $\overline{JK}$  having the given endpoints.**

1. J(-1,2) and K(6,1)

$$\left(\frac{-1+6}{2}, \frac{2+1}{2}\right)$$

$$\left(\frac{5}{2}, \frac{3}{2}\right)$$

2. J(8,-6) and K(-14,12)

$$\begin{array}{ccc} x_1 & y_1 & x_2 & y_2 \\ 8 & -6 & -14 & 12 \end{array}$$

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

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

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

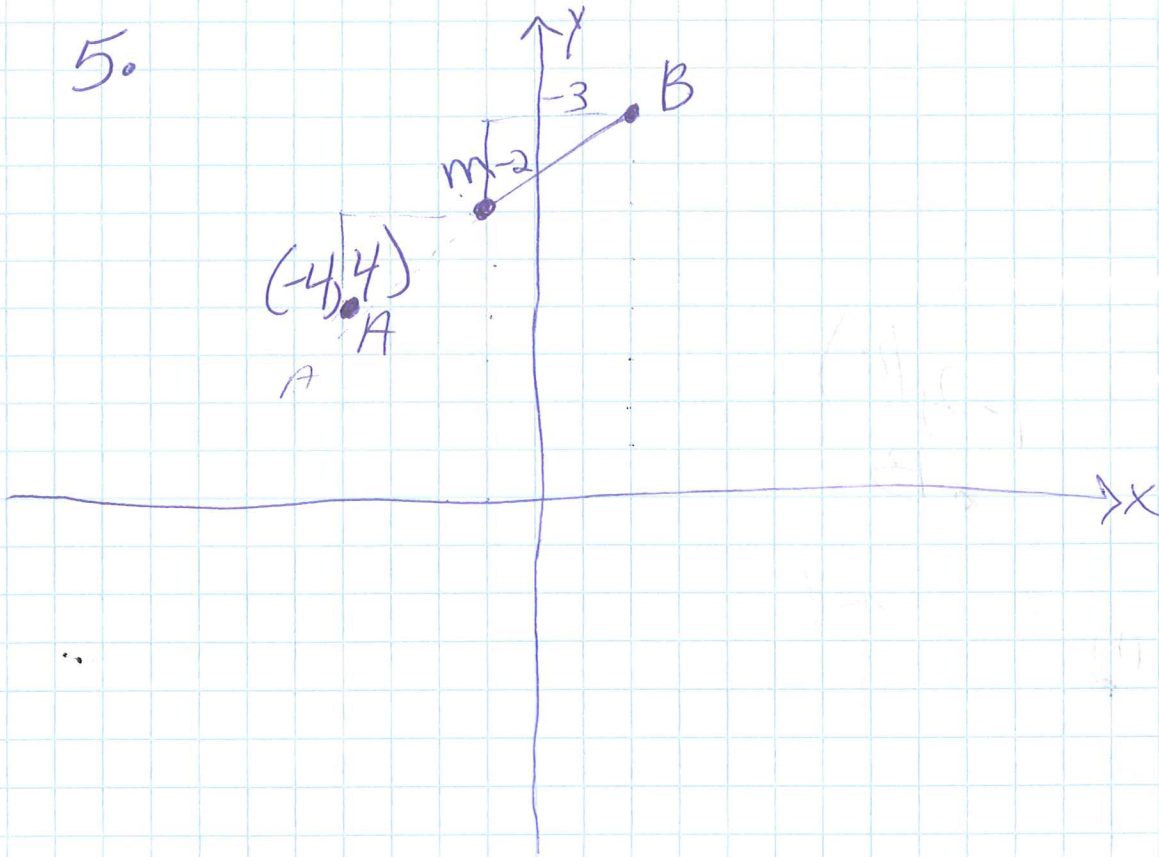
**Directions: M is the midpoint of  $\overline{AB}$ . Find the missing coordinates based on the given information.**

5. M(-1,6), B(2,8) Find A(x,y).

6. M(-5,10), A(-8,6) Find B(x,y)

See graph paper !!

5.



6.

