

Key

Date: _____

Distance, Midpoint, Slope

1. M is the midpoint of the line segment that joins points (4, -2) and (-2, 5)?

$$M = \left(\frac{4 + (-2)}{2}, \frac{-2 + 5}{2} \right) = \left(\frac{2}{2}, \frac{3}{2} \right) = \boxed{(1, 1.5)}$$

2. The endpoints of \overline{AB} are $A(3, -4)$ and $B(7, 2)$. Determine and state the length of \overline{AB} in simplest radical form.

3. What is the slope of a line passing through the points (-2, 1) and (4, -5)?

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

$$m = \frac{-5 - 1}{4 - (-2)} = \frac{-6}{6} = \boxed{-1 = m}$$

4. Point M is the midpoint of \overline{AB} . If the coordinates of A are $(-3, 6)$ and the coordinates of M are $(-5, 2)$, what are the coordinates of B?

$$\begin{array}{l}
 A(-3, 6) \\
 \quad \quad \quad \begin{array}{c} \textcircled{-2} \quad \textcircled{-4} \end{array} \\
 M(-5, 2) \\
 \quad \quad \quad \begin{array}{c} \textcircled{-2} \quad \textcircled{-4} \end{array} \\
 \hline
 B(-7, -2)
 \end{array}$$

5.

Find the value of k so that the slope of the line joining $(5, k)$ and $(6, k^2)$ is 30.

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

$$\frac{30}{1} = \frac{k^2 - k}{6 - 5}$$

$$\frac{30}{1} = \frac{k^2 - k}{1}$$

$$k^2 - k = 30$$

$$-30 \quad -30$$

$$k^2 - k - 30 = 0$$

$$k^2 - k - 30 = 0$$

$$(k - 6)(k + 5) = 0$$

$$k - 6 = 0 \quad | \quad k + 5 = 0$$

$$k = 6 \quad | \quad k = -5$$

$$\boxed{\{-5, 6\}}$$

6. Line segment AB has endpoint A located at the origin. Line segment AB is longest when the coordinates of B are

- 1) $(3, 7)$
- 2) $(2, -8)$
- 3) $(-6, 4)$
- 4) $(-5, -5)$

distance