

Key

Date: \_\_\_\_\_

**Distance, Midpoint, Slope**

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

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  $(4, -5)$ ?

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

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

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?

5.)

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

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

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

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

$$k^2 - k = 30$$

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

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

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

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

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

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

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)  $(-5, -5)$

7. If a line segment has endpoints  $A(3x + 5, 3y)$  and  $B(x - 1, -y)$ , what are the coordinates of the midpoint of  $\overline{AB}$ ?

8.)

If the slope of the line joining the points  $(2, 4)$  and  $(5, k)$  is 2, find the value of  $k$ .

$$m = \frac{Y_2 - Y_1}{X_2 - X_1}$$

$$\frac{2}{1} = \frac{k - 4}{5 - 2}$$

$$\frac{2}{1} = \frac{k - 4}{3}$$

$$k - 4 = 6$$
$$+4 \quad +4$$

$$k = 10$$

9. A line segment on the coordinate plane has endpoints  $(2, 4)$  and  $(4, y)$ . The midpoint of the segment is point  $(3, 7)$ . What is the value of  $y$ ?

10.

Two points whose coordinates are  $(-7)$  and  $(2,a)$  determine a line whose slope is 6. Find the value of  $a$ .

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

$$\frac{6}{1} = \frac{a - 17}{2 - 4}$$

$$\frac{a - 17}{-2}$$

$$a = 5$$

$$\begin{array}{r} a - 17 = -12 \\ + 17 \quad + 17 \\ \hline \end{array}$$

11. In circle  $O$ , a diameter has endpoints  $(-5,4)$  and  $(3,-6)$ . What is the length of the diameter?

12.  $M$  is the midpoint of  $\overline{AB}$ . If the coordinates of  $A$  are  $(-1,5)$  and the coordinates of  $M$  are  $(3,3)$ , what are the coordinates of  $B$ ?

13. In Circle  $O$ , a diameter has endpoints  $(-3,2)$  and  $(1,0)$ , what is the length of the radius to the nearest tenth?

14.

If the points  $(3,5)$ ,  $(4,2)$  and  $(5,k)$  lie on a straight line, the value of  $k$  is

A) 1

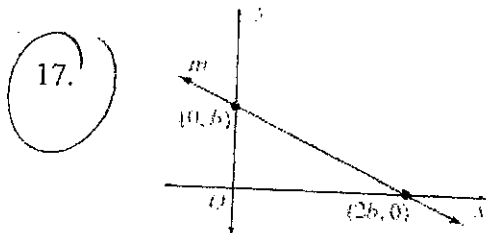
B) -2

C) -1

D) 0

15. In circle  $O$ , diameter  $\overline{RS}$  has endpoints  $R(3a, 2b - 1)$  and  $S(a - 6, 4b + 5)$ . Find the coordinates of point  $O$ , in terms of  $a$  and  $b$ . Express your answer in simplest form.

16. Find the value of  $k$ , given the points  $P(2, 3)$  and  $Q(k, -1)$ , if  $PQ$  has slope,  $m = \text{undefined}$ .  
vertical line  
have to be the same  
 $k = 2$



$(0, b)$   
 $(2b, 0)$

$$m = \frac{b - 0}{0 - 2b}$$

$$m = \frac{b}{-2b} \quad \boxed{-\frac{1}{2} = m}$$

In the given figure, what is the slope of line  $m$ ?

(1) 2

(2)  $\frac{1}{2}$

(3)  $-\frac{1}{2}$

(4) -2

