

Semester Review -- Coordinate Geometry

Find the midpoint of the line segment with the given endpoints.

1) $(-6, 7), (-7, -6)$
 $x_1 \ y_1 \ x_2 \ y_2$

$$\left(\frac{-6 + (-7)}{2}, \frac{7 + (-6)}{2} \right)$$

$$\left(-\frac{13}{2}, \frac{1}{2} \right)$$

2) $(-3, 3), (-1, -8)$
 $x_1 \ y_1 \ x_2 \ y_2$

$$\left(\frac{-3 + (-1)}{2}, \frac{3 + (-8)}{2} \right)$$

$$-\frac{4}{2}, -\frac{5}{2} \quad \left(-2, -\frac{5}{2} \right)$$

3) $(0, -8), (-8, 2)$
 $x_1 \ y_1 \ x_2 \ y_2$

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

$$(-4, -3)$$

4) $(4, 9), (-2, -9)$
 $x_1 \ y_1 \ x_2 \ y_2$

$$\left(\frac{2}{2}, \frac{0}{2} \right)$$

$$(1, 0)$$

Find the other endpoint of the line segment with the given endpoint and midpoint.

5) Endpoint: $(7, 6)$, midpoint: $(-9, 2)$
 (Diagram: A horizontal line segment with an arrow pointing left from the midpoint to the endpoint, labeled -16 . A horizontal line segment with an arrow pointing right from the endpoint to the midpoint, labeled -4 .)

$$(-25, -2)$$

6) Endpoint: $(10, -6)$, midpoint: $(-3, -1)$
 (Diagram: A horizontal line segment with an arrow pointing left from the midpoint to the endpoint, labeled -13 . A horizontal line segment with an arrow pointing right from the endpoint to the midpoint, labeled $+5$.)

$$(-16, 4)$$

7) Endpoint: $(-8, -10)$, midpoint: $(-9, 9)$
 (Diagram: A horizontal line segment with an arrow pointing left from the midpoint to the endpoint, labeled -1 . A horizontal line segment with an arrow pointing right from the endpoint to the midpoint, labeled $+19$.)

$$(-10, 28)$$

8) Endpoint: $(-4, 8)$, midpoint: $(-3, -1)$
 (Diagram: A horizontal line segment with an arrow pointing left from the midpoint to the endpoint, labeled $+1$. A horizontal line segment with an arrow pointing right from the endpoint to the midpoint, labeled -9 .)

$$(-2, -10)$$

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

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

9) (1, -7), (2, -8)

$$d = \sqrt{(2-1)^2 + (-8+7)^2}$$

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

$$d = \sqrt{2}$$

10) (-6, -3), (-8, 7)

$$d = \sqrt{(-8+6)^2 + (7+3)^2}$$

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

$$d = \sqrt{104}$$

Find the slope of the line through each pair of points.

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

11) (19, 16), (-20, 8)

$$m = \frac{8-16}{-20-19} = \frac{-8}{-39} = \boxed{\frac{8}{39}}$$

12) (7, 4), (12, -19)

$$m = \frac{-19-4}{12-7} = \boxed{\frac{-23}{5}}$$

13) (-6, -17), (3, 5)

$$m = \frac{5+17}{3+6} = \boxed{\frac{22}{9}}$$

14) (-19, 12), (-7, -13)

$$m = \frac{-13-12}{-7+19} = \boxed{\frac{-25}{12}}$$

Write the slope-intercept form of the equation of the line through the given point with the given slope.

15) through: (3, 3), slope = $\frac{1}{3}$

$$y = mx + b$$

$$3 = \frac{1}{3}(3) + b$$

$$3 = 1 + b$$

$$\begin{array}{r} -1 \quad -1 \\ 3 = 1 + b \\ \hline 2 = b \end{array}$$

$$\boxed{y = \frac{1}{3}x + 2}$$

16) through: (-5, -4), slope = $\frac{6}{5}$

$$y = mx + b$$

$$-4 = \frac{6}{5}(-5) + b$$

$$-4 = -6 + b$$

$$\begin{array}{r} +6 \quad +6 \\ -4 = -6 + b \\ \hline 2 = b \end{array}$$

$$\boxed{y = \frac{6}{5}x + 2}$$