

Distance, Midpoint, and Slope Formulas

1-29 ODD, Evens for Ext. Cred

Find the distance between each pair of points.

1) $(0, -8), (-6, 0)$
 (x_1, y_1)
 (x_2, y_2)

$$\sqrt{(-6-0)^2 + (0-(-8))^2}$$

$$= 10$$

2) $(-7, -1), (-2, -4)$
 (x_1, y_1)
 (x_2, y_2)

$$\sqrt{(-2-(-7))^2 + (-4-(-1))^2}$$

$$= \sqrt{34} \text{ or } 5.83$$

3) $(4, 3), (-3, 6)$
 (x_1, y_1)
 (x_2, y_2)

$$\sqrt{(-3-4)^2 + (6-3)^2}$$

$$= \sqrt{58} \text{ or } 7.62$$

4) $(6, 3), (-2, -3)$
 (x_1, y_1)
 (x_2, y_2)

$$\sqrt{(-2-6)^2 + (-3-3)^2}$$

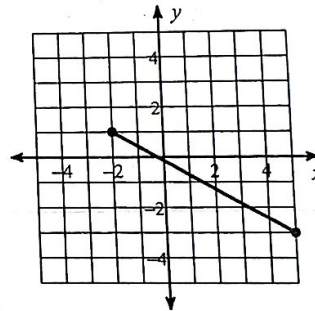
$$= 10$$

5) $(-1, -6), (3, 7)$
 (x_1, y_1)
 (x_2, y_2)

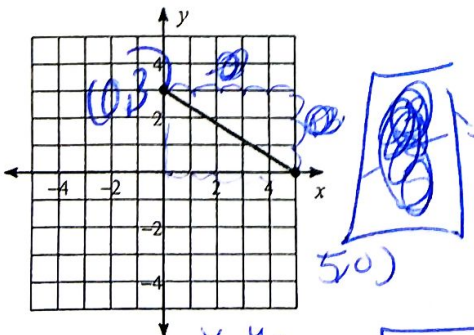
$$\sqrt{(3-(-1))^2 + (7-(-6))^2}$$

$$= \sqrt{185} \text{ or } 13.6$$

6)



7)

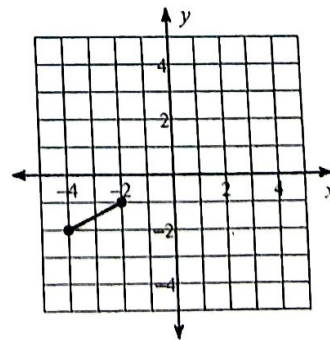


(x_1, y_1)
 $(0, 3)$
 (x_2, y_2)
 $(5, 0)$

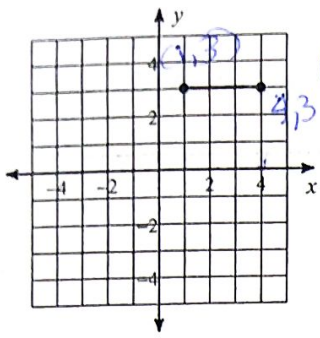
$$\sqrt{(5-0)^2 + (0-3)^2}$$

$$= \sqrt{34} \text{ or } 5.83$$

8)



9)

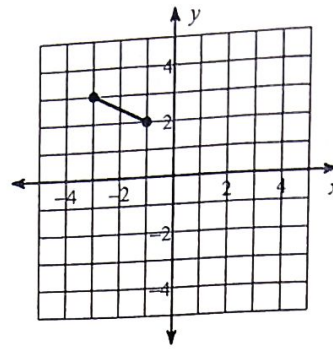


x_1, y_1
 $(1, 3)$
 x_2, y_2
 $(4, 3)$

$$\sqrt{(4-1)^2 + (3-3)^2}$$

$$= 3$$

10)



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

11) $(8, -4), (2, -1)$

$$\frac{8+2}{2}, \frac{-4+(-1)}{2}$$

$$\frac{10}{2}, \frac{-5}{2}$$

$$(5, -2.5)$$

12) $(7, 3), (-7, -8)$

$$\left(\frac{7+(-7)}{2}, \frac{3+(-8)}{2} \right)$$

$$\left(\frac{0}{2}, \frac{-5}{2} \right) = (0, -2.5)$$

13) $(7, -1), (-5, 6)$

$$\frac{7+(-5)}{2}, \frac{-1+6}{2}$$

$$\frac{2}{2}, \frac{5}{2}$$

$$(1, 2.5)$$

14) $(0, 6), (2, -7)$

15) $(7, -3), (-3, -7)$

7.

Given the midpoint and one endpoint of a line segment, find the other endpoint.

16) Endpoint: $(7, -9)$, midpoint: $(8, -4)$

17) Endpoint: $(-4, -9)$, midpoint: $(1, 8)$

$$2 \cdot \frac{-4 + x_2}{2} = 1 \cdot 2$$

$$\begin{array}{r} -4 + x_2 = 2 \\ +4 \quad +4 \\ \hline x_2 = 6 \end{array}$$

$$x_2 = 6$$

$$2 \cdot \frac{-9 + y_2}{2} = 8 \cdot 2$$

$$\begin{array}{r} -9 + y_2 = 16 \\ +9 \quad +9 \\ \hline y_2 = 25 \end{array}$$

$$y_2 = 25$$

$$(6, 25)$$

18) Endpoint: $(-1, -3)$, midpoint: $(-5, -4)$

19) Endpoint: $(-9, 6)$, midpoint: $(5, -10)$

$$\frac{-9 + x_2}{2} = 5 \quad \frac{6 + y_2}{2} = -10$$

$$\begin{array}{r} -9 + x_2 = 10 \\ +9 \quad +9 \\ \hline x_2 = 19 \end{array}$$

$$\begin{array}{r} 6 + y_2 = -20 \\ -6 \quad -6 \\ \hline y_2 = -26 \end{array}$$

$$x_2 = 19$$

$$y_2 = -26$$

$$\boxed{(19, -26)}$$

20) Endpoint: $(-3, 2)$, midpoint: $(9, 0)$

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

21) $(2, 1), (15, 10)$

$$\frac{10-1}{15-2} = \frac{9}{13}$$

22) $(-5, -16), (-14, -5)$

23) $(11, 18), (13, -17)$

$$\frac{-17-18}{13-11} = \frac{-35}{2}$$

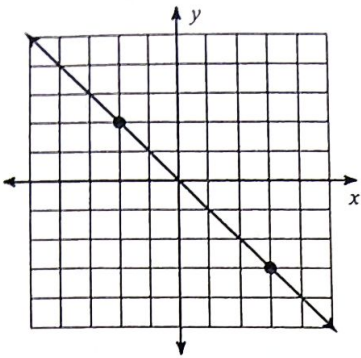
24) $(-10, -1), (-17, 14)$

25) $(-12, 9), (7, 0)$

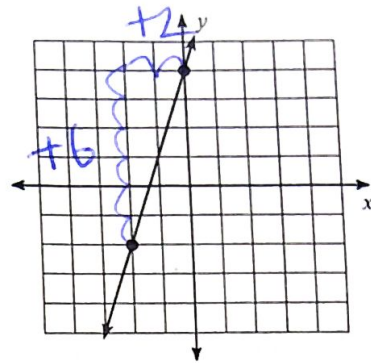
$$\frac{0-9}{7-(-12)} = \frac{-9}{19}$$

Find the slope of each line.

26)

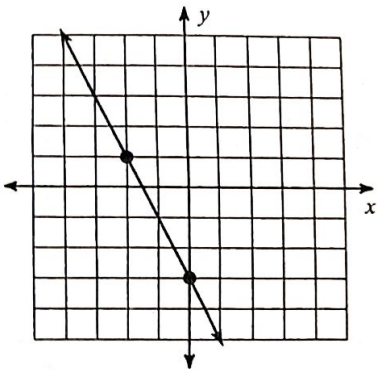


27)

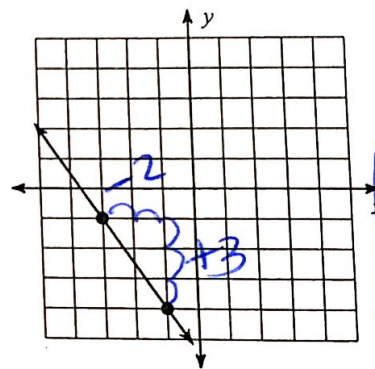


$$\frac{6}{2} = \boxed{3}$$

28)



29)



$$\frac{-4}{2} = \boxed{\frac{3}{-2}}$$

30)

