

Slope Formulas

Using a Graph

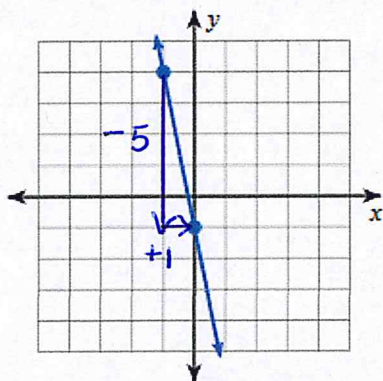
$$m = \frac{\text{rise}}{\text{run}}$$

Using Two Points

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

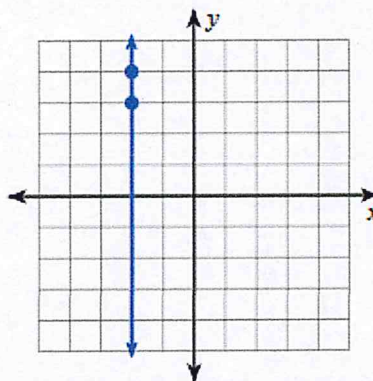
Find the slope of the line using the points on the graph.

1)



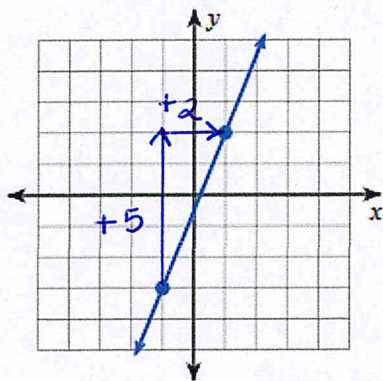
$$-\frac{3}{1} \text{ or } -3$$

2)



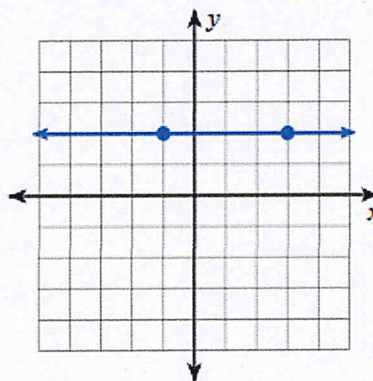
Undefined

3)



$$\frac{3}{3}$$

4)



0

Find the slope of the line that passes through the given points.

5) $(-14, -8)$ and $(0, -8)$

$$m = \frac{-8 - (-8)}{0 - (-14)} = \frac{-8 + 8}{0 + 14} = \frac{0}{14} = 0$$

6) $(-4, 14)$ and $(-1, -7)$

$$m = \frac{-7 - 14}{-1 - (-4)} = \frac{-21}{-1 + 4} = \frac{-21}{3} = -7$$

7) $(-5, 14)$ and $(-13, -6)$

$$m = \frac{-6 - 14}{-13 - (-5)} = \frac{-20}{-13 + 5} = \frac{-20}{-8} = \frac{5}{2}$$

8) $(15, -20)$ and $(15, -13)$

$$m = \frac{-13 - (-20)}{15 - 15} = \frac{-13 + 20}{0} = \frac{7}{0}$$

Undefined

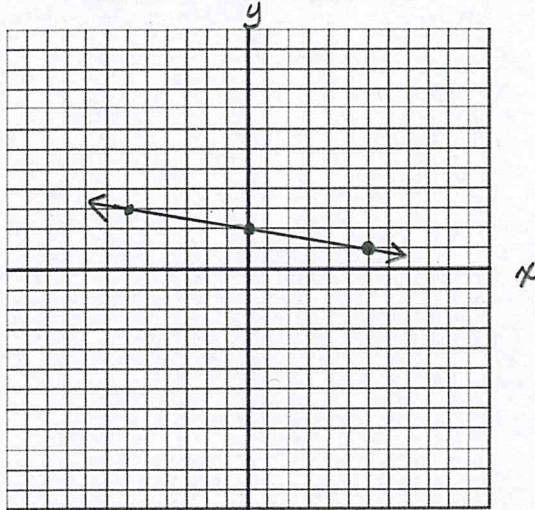
Types of Linear Equations

Slope-Intercept Form	Standard Form	Point-Slope Form
$y = mx + b$ where m is the slope and b is the y -intercept	$Ax + By = C$ where $A, B,$ and C are integers	$y - y_1 = m(x - x_1)$ where m is the slope and (x_1, y_1) is a point on the line

Convert each equation from standard to slope-intercept form. Identify the slope and y -intercept. Then, graph it.

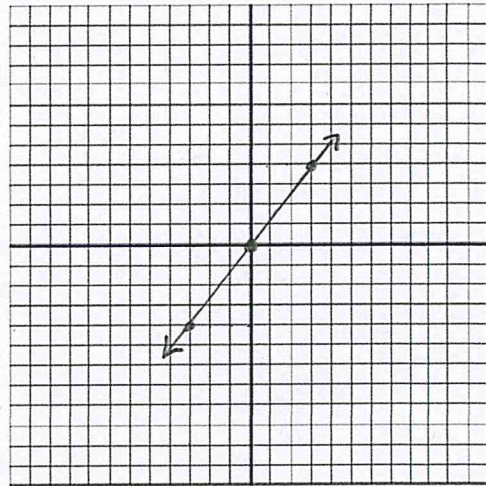
9) $x + 6y = 12$

Slope-Intercept: $y = -\frac{1}{6}x + 2$
 $m = -\frac{1}{6}, b = 2$



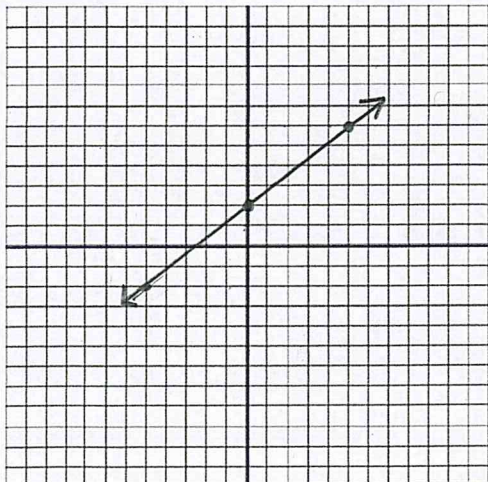
10) $4x - 3y = 0$

Slope-Intercept: $y = \frac{4}{3}x$ or $y = \frac{4}{3}x + 0$
 $m = \frac{4}{3}, b = 0$



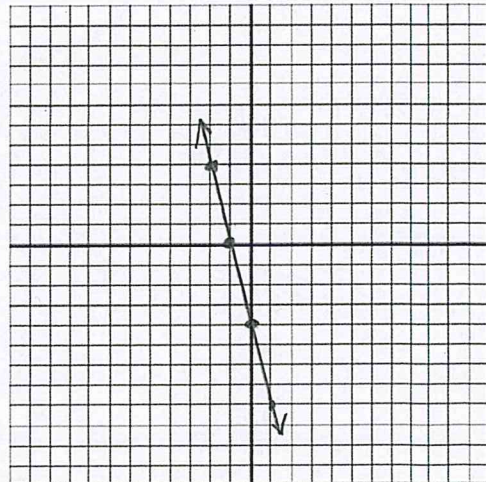
11) $4x - 5y = -10$

Slope-Intercept: $y = \frac{4}{5}x + 2$
 $m = \frac{4}{5}, b = 2$



12) x -intercept = -1 and y -intercept = -4

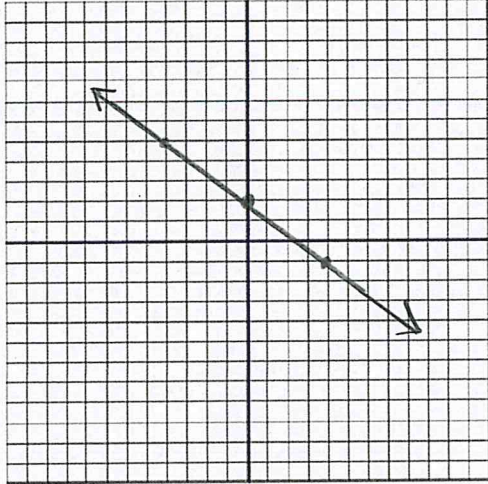
Slope-Intercept: $y = -4x - 4$
 $m = -4, b = -4$



Convert each equation from point-slope to slope-intercept form. Identify the slope and y -intercept. Then, graph it.

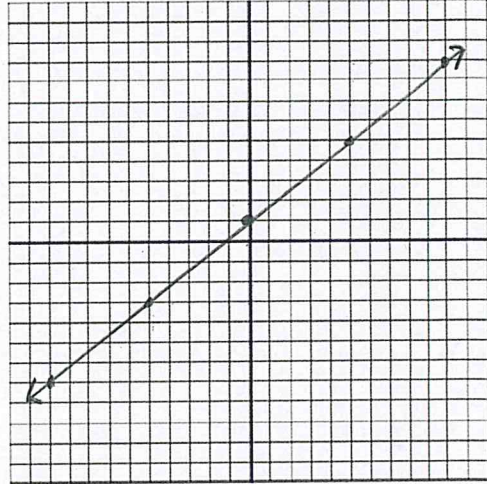
13) $y + 1 = -\frac{3}{4}(x - 4)$

Slope-Intercept: $y = -\frac{3}{4}x + 2$
 $m = -\frac{3}{4}$, $b = 2$



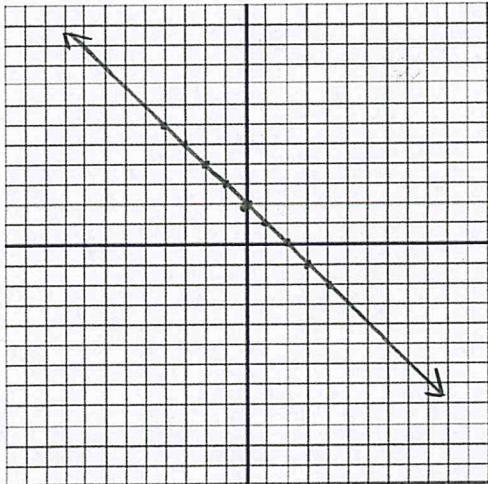
14) $y + 3 = \frac{4}{5}(x + 5)$

Slope-Intercept: $y = \frac{4}{5}x + 1$
 $m = \frac{4}{5}$, $b = 1$



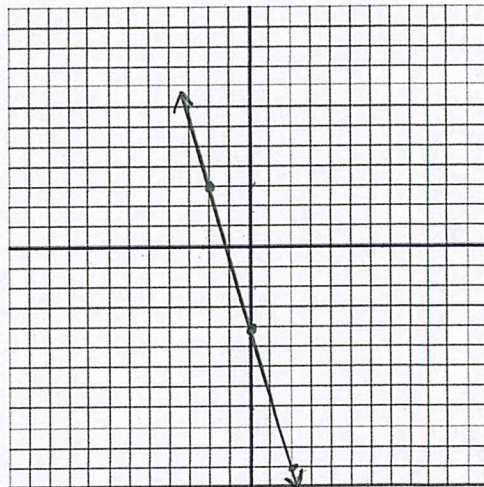
15) $y + 1 = -(x - 3)$

Slope-Intercept: $y = -x + 2$ or $y = -1x + 2$
 $m = -1$, $b = 2$



16) $y - 3 = -\frac{7}{2}(x + 2)$

Slope-Intercept: $y = -\frac{7}{2}x - 4$
 $m = -\frac{7}{2}$, $b = -4$

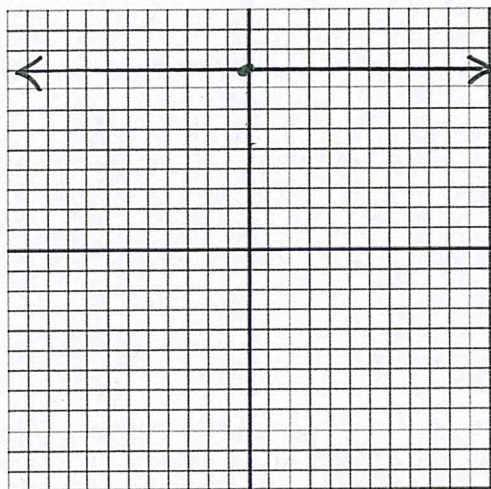


Graph the horizontal and vertical lines.

17) $y = 9$

Circle one: HOY VUX

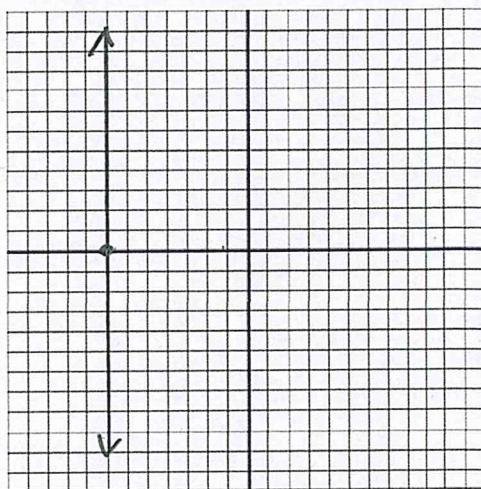
$m = 0$



18) $x = -7$

Circle one: HOY VUX

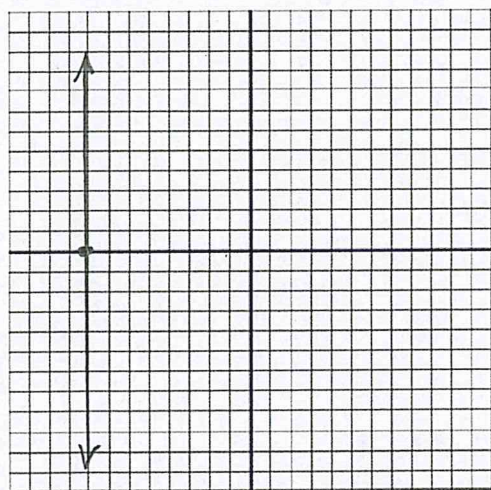
$m = \text{undefined}$



19) $-3x = 24$

Circle one: HOY VUX

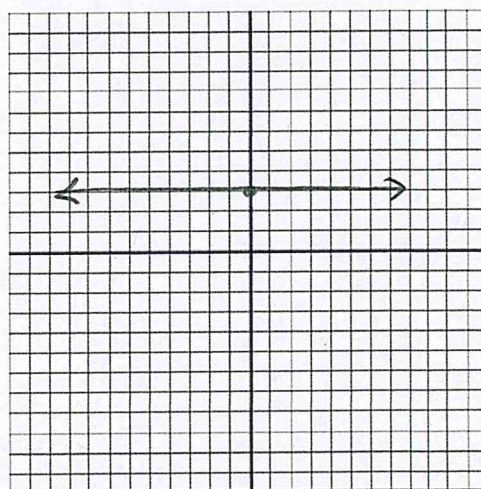
$m = \text{undefined}$



20) $-2y = -6$

Circle one: HOY VUX

$m = 0$



$$\begin{aligned} \textcircled{9} \quad x + 6y &= 12 \\ \cancel{-x} &\quad \quad \quad \cancel{-x} \\ \hline 6y &= \frac{-x+12}{6} \\ y &= \frac{-1}{6}x + 2 \end{aligned}$$

$$\begin{aligned} \textcircled{10} \quad 4x - 3y &= 0 \\ \cancel{-4x} &\quad \quad \quad \cancel{-4x} \\ \hline -3y &= \frac{-4x}{-3} \\ y &= \frac{4}{3}x + 0 \end{aligned}$$

$$\begin{aligned} \textcircled{11} \quad 4x - 5y &= -10 \\ \cancel{-4x} &\quad \quad \quad \cancel{-4x} \\ \hline -5y &= \frac{-4x-10}{-5} \\ y &= \frac{4}{5}x + 2 \end{aligned}$$

$$\begin{aligned} \textcircled{12} \quad (-1, 0) \text{ and } (0, -4) \\ m &= \frac{-4-0}{0-(-1)} = \frac{-4}{1} = -4 \\ y - 0 &= -4(x - (-1)) \\ y &= -4(x + 1) \\ y &= -4x - 4 \end{aligned}$$

$$\begin{aligned} \textcircled{13} \quad y + 1 &= \frac{-3}{4}(x - 4) \\ y + 1 &= \frac{-3}{4}x + 3 \\ \cancel{-x} &\quad \quad \quad \cancel{-1} \\ \hline y &= \frac{-3}{4}x + 2 \end{aligned}$$

$$\begin{aligned} \textcircled{14} \quad y + 3 &= \frac{4}{5}(x + 5) \\ y + 3 &= \frac{4}{5}x + 4 \\ \cancel{-3} &\quad \quad \quad \cancel{-3} \\ \hline y &= \frac{4}{5}x + 1 \end{aligned}$$

$$\begin{aligned} \textcircled{15} \quad y + 1 &= -(x - 3) \\ y + 1 &= -x + 3 \\ \cancel{-x} &\quad \quad \quad \cancel{-1} \\ \hline y &= -x + 2 \end{aligned}$$

$$\begin{aligned} \textcircled{16} \quad y - 3 &= \frac{-7}{2}(x + 2) \\ y - 3 &= \frac{-7}{2}x - 7 \\ \cancel{+3} &\quad \quad \quad \cancel{+3} \\ \hline y &= \frac{-7}{2}x - 4 \end{aligned}$$

$$\textcircled{19} \quad \frac{-3x}{-3} = \frac{24}{-3}$$

$$x = -8$$

$$\textcircled{20} \quad \frac{-2y}{-2} = \frac{-6}{-2}$$

$$y = 3$$