

1. In which quadrant or axis does each of the following lie?

(a) (10, 5) **Quadrant I**

(b) (1, 0) **x-axis**

(c) (5, -1) **Quadrant IV**

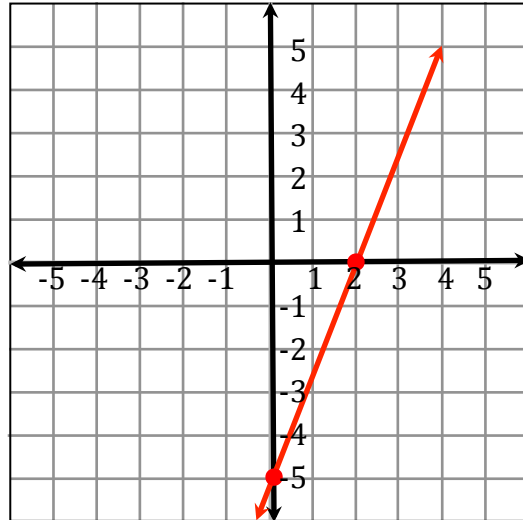
(d) (-2, -4) **Quadrant III**

2. State the x-intercept and y-intercept and use them to graph the equation

$$5x - 2y = 10$$

x-intercept: (**2** , **0**)

y-intercept: (**0** , **-5**)



3. Solve for y, then complete the table of values for

$$-6x + 3y = -3$$

$$\begin{array}{r} +6x \quad \quad +6x \\ 0 + 3y = 6x - 3 \end{array}$$

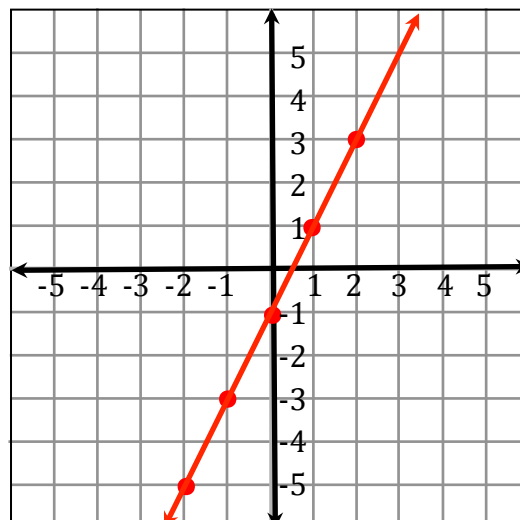
$$\frac{3y}{3} = \frac{6x - 3}{3}$$

$$y = \frac{6x}{3} - \frac{3}{3}$$

$$y = 2x - 1$$

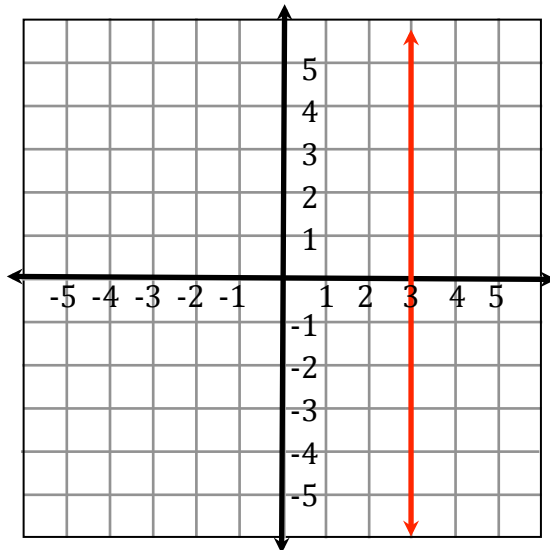
x	y
-2	$2(-2) - 1 = -4 - 1 = -5$
-1	$2(-1) - 1 = -2 - 1 = -3$
0	$2(0) - 1 = 0 - 1 = -1$
1	$2(1) - 1 = 2 - 1 = 1$
2	$2(2) - 1 = 4 - 1 = 3$

4. Use the table of values in #3 to graph the equation $-6x + 3y = -3$.



5. Graph

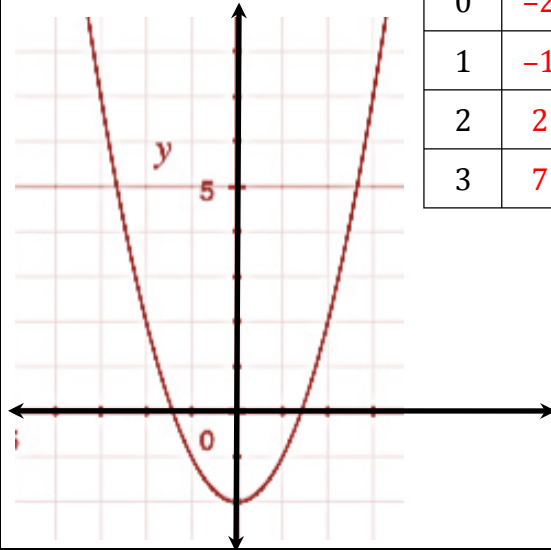
$x = 3$



6. Graph

$y = x^2 - 2$

x	y
-3	7
-2	2
-1	-1
0	-2
1	-1
2	2
3	7



7. Determine the slope and y-intercept of each equation

(a) $y = \frac{1}{3}x - 10$

$m = \frac{1}{3}$ and $b = -10$

(b) $y = -x + 2$

$m = -1$ and $b = 2$

8. Determine the slope and y-intercept of each equation

(a) $y = -\frac{3}{4}x$

$m = -\frac{3}{4}$ and $b = 0$

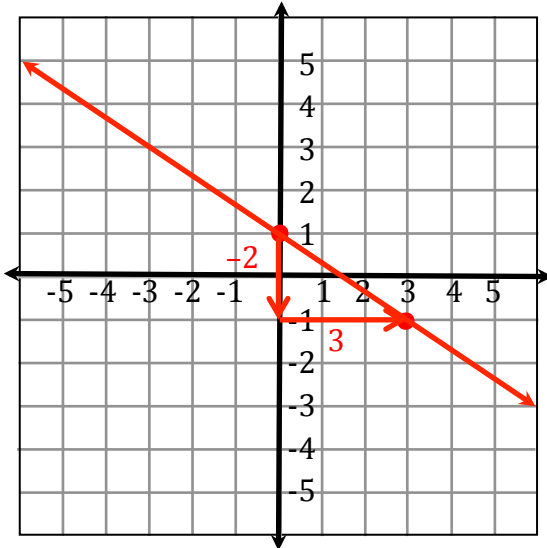
(b) $y = 5$

$m = 0$ and $b = 5$

<p>9. (a) Determine the slope of the line that passes through the points (x_1, y_1) and (x_2, y_2) (a) (5, 4) and (4, 1)</p> $m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{1 - 4}{4 - 5} = \frac{1 + (-4)}{4 + (-5)} = \frac{-3}{-1} = 3$ <p>(x_1, y_1) and (x_2, y_2) (b) (-3, -3) and (-2, -4)</p> $m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-4 - (-3)}{-2 - (-3)} = \frac{-4 + 3}{-2 + 3} = \frac{-1}{1} = -1$	<p>10. Are the following lines parallel, perpendicular or neither?</p> <p>(a) $y = -3x + 4$ $y = 3x + 5$</p> <p>Neither</p> <p>(b) $y = \frac{3}{7}x + 4$ $y = -\frac{7}{3}x + 5$</p> <p>Perpendicular</p>
<p>11. Are the following lines parallel, perpendicular or neither?</p> <p>(a) $y = 4x + 4$ $y = 4x + 5$</p> <p>Parallel</p> <p>(b) $y = \frac{4}{5}x + 4$ $y = \frac{5}{4}x + 5$</p> <p>Neither</p>	<p>12. (a) Determine the slope of the line with the following equation:</p> $x - 2y = 12$ $\frac{-x}{0} - 2y = \frac{-x}{-x+12}$ $\frac{-2y}{-2} = \frac{-x+12}{-2}$ $y = \frac{-x}{-2} + \frac{12}{-2}$ $y = \frac{1}{2}x - 6$ $m = \frac{1}{2}$ <p>(b) What is the slope of a line perpendicular to the one above?</p> $m_{\perp} = -2$

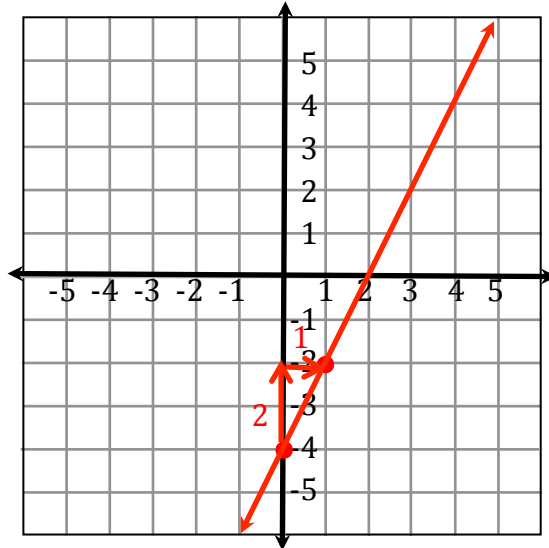
13. Use the slope and y-intercept to graph

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



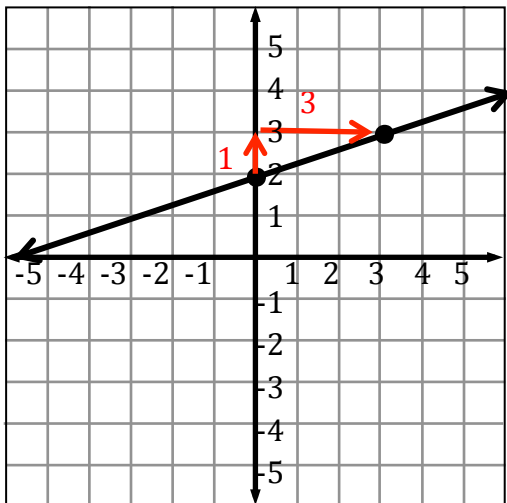
14. Use the slope and y-intercept to graph

$$y = 2x - 4$$



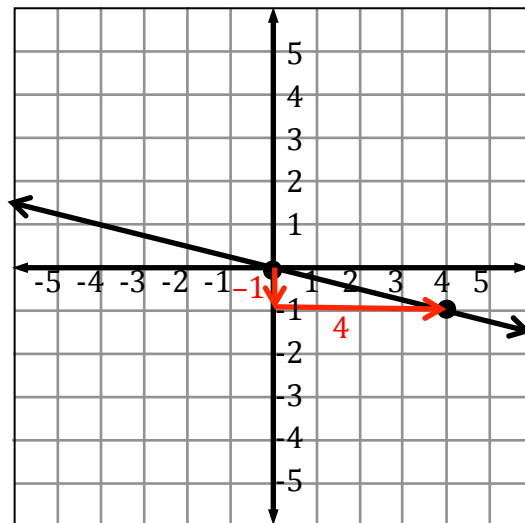
15. Write the equation in slope-intercept form ($y = mx + b$) of the line shown.

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



16. Write the equation in slope-intercept form ($y = mx + b$) of the line shown.

$$y = -\frac{1}{4}x$$



17. Write the equation in slope-intercept form ($y = mx + b$) of a line that has slope -5 and passes through $(0, 1)$.

$$\begin{aligned} y - y_1 &= m(x - x_1) \\ y - 1 &= -5(x - 0) \\ y - 1 &= -5x + 0 \\ \quad +1 \quad \quad +1 \\ y + 0 &= -5x + 1 \\ y &= -5x + 1 \end{aligned}$$

18. Write the equation in slope-intercept form ($y = mx + b$) of a line that has slope $\frac{1}{4}$ and passes through $(4, 5)$.

$$\begin{aligned} y - y_1 &= m(x - x_1) \\ y - 5 &= \frac{1}{4}(x - 4) \\ y - 5 &= \frac{1}{4}x - 1 \\ \quad +5 \quad \quad +5 \\ y + 0 &= \frac{1}{4}x + 4 \\ y &= \frac{1}{4}x + 4 \end{aligned}$$

19. Write the equation in slope-intercept form ($y = mx + b$) of the line that passes through

(x_1, y_1) and (x_2, y_2)
 $(-3, -5)$ and $(0, 1)$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{1 - (-5)}{0 - (-3)} = \frac{1 + 5}{0 + 3} = \frac{6}{3} = 2$$

$$\begin{aligned} y - y_1 &= m(x - x_1) \\ y - (-5) &= 2(x - (-3)) \\ y + 5 &= 2(x + 3) \\ y + 5 &= 2x + 6 \\ \quad -5 \quad \quad -5 \\ y + 0 &= 2x + 1 \\ y &= 2x + 1 \end{aligned}$$

20. Write the equation in slope-intercept form ($y = mx + b$) of the line that passes through

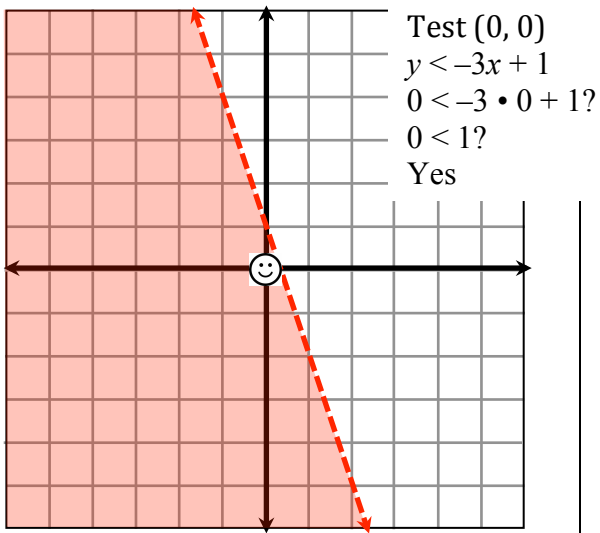
(x_1, y_1) and (x_2, y_2)
 $(4, -2)$ and $(0, -2)$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{-2 - (-2)}{0 - 4} = \frac{-2 + 2}{-4} = \frac{0}{-4} = 0$$

$$\begin{aligned} y - y_1 &= m(x - x_1) \\ y - (-2) &= 0(x - 4) \\ y + 2 &= 0 \\ \quad -2 \quad -2 \\ y + 0 &= -2 \\ y &= -2 \end{aligned}$$

<p>21. Write the equation in slope-intercept form ($y = mx + b$) of the line that passes through (6, 1) and is parallel to</p> $-6x + 3y = 12$ $\begin{array}{r} +6x \\ 0 + 3y = 6x + 12 \end{array}$ $\frac{3y}{3} = \frac{6x+12}{3}$ $y = \frac{6x}{3} + \frac{12}{3}$ $y = 2x + 4$ $m = 2$ $y - y_1 = m(x - x_1)$ $y - 1 = 2(x - 6)$ $y - 1 = 2x - 12$ $\begin{array}{r} +1 \\ y + 0 = 2x - 11 \end{array}$ $y = 2x - 11$	<p>22. Write the equation in slope-intercept form ($y = mx + b$) of the line that passes through (6, 1) and is perpendicular to</p> $-6x + 3y = 12$ $\begin{array}{r} +6x \\ 0 + 3y = 6x + 12 \end{array}$ $\frac{3y}{3} = \frac{6x+12}{3}$ $y = \frac{6x}{3} + \frac{12}{3}$ $y = 2x + 4$ $m = 2 \text{ and } m_{\perp} = -\frac{1}{2}$ $y - y_1 = m(x - x_1)$ $y - 1 = -\frac{1}{2}(x - 6)$ $y - 1 = -\frac{1}{2}x + 3$ $\begin{array}{r} +1 \\ y + 0 = -\frac{1}{2}x + 4 \end{array}$ $y = -\frac{1}{2}x + 4$
<p>23. Determine if the following mappings are functions or not.</p> <p>(a) $x \rightarrow y$</p> $0 \rightarrow -4$ $3 \rightarrow -2$ $5 \rightarrow -2$ <p>Yes. This is a function.</p> <p>Every x-value is paired with exactly one y-value.</p> <p>(b) $x \rightarrow y$</p> $1 \rightarrow 1$ $1 \rightarrow 3$ $2 \rightarrow 5$ <p>No. This is not a function.</p> <p>$x = 1$ is mapped to $y = 1$ and $y = 3$.</p>	<p>24.</p> <p>(a) For $f(x) = 2x + 3$, find $f(4)$.</p> $f(4) = 2 \cdot 4 + 3$ $f(4) = 8 + 3$ $f(4) = 11$ <p>(b) For $f(x) = (x - 1)^2$, find $f(-5)$.</p> $f(-5) = (-5 - 1)^2$ $f(-5) = (-6)^2$ $f(-5) = 36$

25. (a) Graph $y < -3x + 1$



(b) Graph $y \geq 1$

