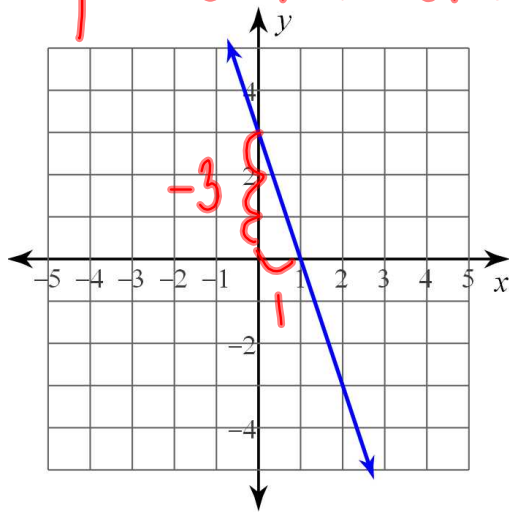


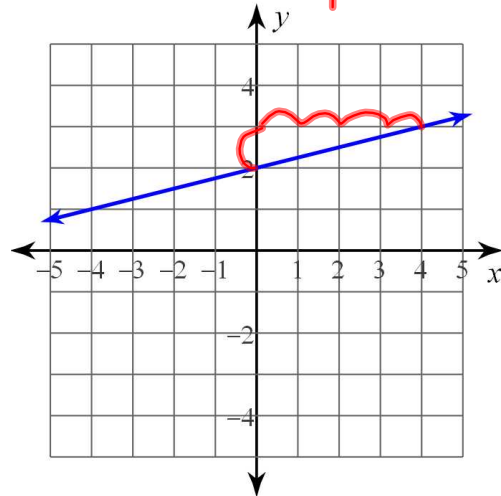
2.4 -- Writing Linear Equations

Ex.1: Write the equation of the lines in slope-intercept form.

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



$$y = \frac{1}{4}x + 2$$



Ex.2: Write the following equations in slope-intercept form and identify the slope and y-intercept. \rightarrow solve for y (get y alone)

A) $3x - 2y = -10 + 3x$

$-3x$
 $-2y = 3x - 10 \rightarrow \frac{-2y}{-2} = \frac{3x - 10}{-2}$

$y = \left(\frac{3}{2}\right)x + 5$

B) $x - 2y = 8$

$x - 8 = 2y$

$\frac{x}{2} - 4 = y$

Ex.3: Write an equation in slope-intercept form for the line that has a slope of $-\frac{3}{5}$ and passes through $(5, -2)$.

$$y = mx + b$$

$$-2 = \left(-\frac{3}{5}\right)5 + b$$

$$-2 = -3 + b$$

$$b = 1$$

$$y = -\frac{3}{5}x + 1$$

Ex.4: What is an equation in slope-intercept form for the line that has a slope of $\frac{2}{3}$ and passes through $(-3, -1)$?

$\frac{2}{3}$
↑
m

↑ ↑
x y

$$y = mx + b$$

$$-1 = \frac{2}{3} \cdot (-3) + b$$

$$-1 = -2 + b$$

$$b = 1$$

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

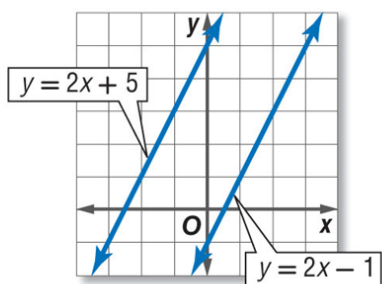
Ex. 5: What is an equation of the line through (2, -3) and (-3, 7)?

*No slope given, but we can find the slope

$$\frac{\Delta y}{\Delta x} = \frac{-3-7}{2-(-3)} = \frac{-10}{5} = -2 = m$$

KeyConcept Parallel and Perpendicular Lines**Parallel Lines**

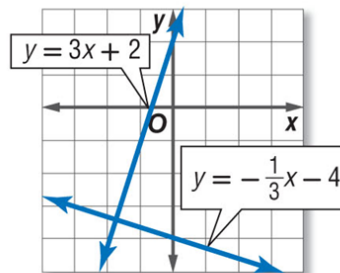
Two nonvertical lines are **parallel** if and only if they have the same slope. All vertical lines are parallel.



$$y = 2x + 5 \text{ and } y = 2x - 1$$

Perpendicular Lines

Two nonvertical lines are **perpendicular** if and only if the product of the slopes is -1 . Vertical lines and horizontal lines are perpendicular.



$$y = 3x + 2 \text{ and } y = -\frac{1}{3}x - 4$$

Ex. 6: Write an equation of a line that contains the point (3, 5) and is parallel to $y = 3x - 2$.

Ex. 7: Write an equation of a line that contains the point (3, 5) and is perpendicular to $y = 3x - 2$.