

### HOW TO

#### Find an equation of a line given the slope and a point.

Step 1. Identify the slope.

Step 2. Identify the point.

Step 3. Substitute the values into the point-slope form,  $y - y_1 = m(x - x_1)$ .

Step 4. Write the equation in slope-intercept form.

Find an equation of a line with slope  $m = -\frac{1}{3}$  that contains the point  $(6, -4)$ . Write the equation in slope-intercept form.

Find an equation of a line with slope  $m = -\frac{2}{5}$  that contains the point  $(10, -5)$ . Write the equation in slope-intercept form.

Find the equation of a horizontal line that contains the point  $(-1, 2)$ . Write the equation in slope-intercept form.

Find the equation of a horizontal line that contains the point  $(-3, 8)$ . Write the equation in slope-intercept form.

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$
$$= \frac{6 - 4}{3 - 5} = \frac{2}{-2}$$
$$= -1$$

Find an equation of a line that contains the points  $(5, 4)$  and  $(3, 6)$ . Write the equation in slope intercept form.

$$y - 4 = -1(x - 5) \quad (5, 4) \quad y - 6 = -(x - 3) \quad (3, 6)$$
$$y - 4 = -1x + 5 \quad y - 6 = -x + 3$$

$$y = -x + 9$$

$$y = -x + b \quad (5, 4)$$

$$4 = -(5) + b$$

$$9 = b$$

$$y = -x + 9$$

$$y = -x + 9$$

$$6 = -(3) + b \quad (3, 6)$$

$$9 = b$$

$$y = -x + 9$$

$$y - y_1 = m(x - x_1)$$

$$m = \frac{6-1}{5-3} = \frac{5}{2}$$

Find an equation of a line that contains the points  $(3, 1)$  and  $(5, 6)$ .  
Write the equation in slope intercept form.

$$y - 1 = \frac{5}{2}(x - 3)$$

$$y = \frac{5}{2}x - \frac{13}{2}$$

$$y - 1 = \frac{5}{2}x - \frac{15}{2} + \frac{2}{2}$$

$$+1 \qquad +1$$

#### HOW TO

##### Find an equation of a line given two points.

Step 1. Find the slope using the given points.

Step 2. Choose one point.

Step 3. Substitute the values into the point-slope form,  $y - y_1 = m(x - x_1)$ .

Step 4. Write the equation in slope-intercept form.

$$m = -\frac{1}{5}$$

Find an equation of a line that contains the points  $(-3, -1)$  and  $(2, -2)$ .  
Write the equation in slope intercept form.

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

$$-\frac{10}{5} + \frac{2}{5} = -\frac{8}{5}$$

$$-2 = -\frac{1}{5}(2) + b$$

$$y = -\frac{1}{5}x - \frac{8}{5}$$

$$-2 = -\frac{2}{5} + b$$

$$\frac{-3-4}{-2-(-2)} = \frac{-7}{0}$$

undefined

Find an equation of a line that contains the points  $(-2, 4)$  and  $(-2, -3)$ .  
Write the equation in slope intercept form.

$$x = -2$$

$$\frac{-5-(-3)}{1-(-4)} = -\frac{2}{5}$$

Find an equation of a line that contains the points  $(-4, -3)$  and  $(1, -5)$ .  
Write the equation in slope intercept form.

$$-3 = -\frac{2}{5}(-4) + b$$

$$-3 - \frac{8}{5}$$

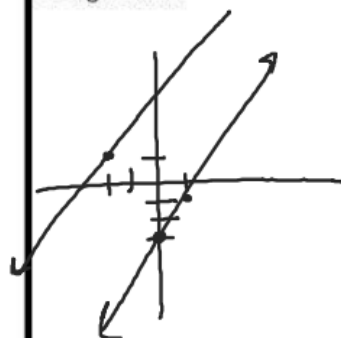
$$-3 = \frac{8}{5} + b$$

$$-\frac{15}{5} - \frac{8}{5} = -\frac{23}{5}$$

$$-\frac{8}{5}$$

$$y = -\frac{2}{5}x - \frac{23}{5}$$

Find equation of a line parallel to a given line



Find equation of a line perpendicular to a given line

$$4 + \frac{1}{2}$$

$$\frac{8}{2} + \frac{1}{2} = \frac{17}{2}$$

To Write an Equation of a Line

If given:	Use:	Form:
Slope and y-intercept	slope-intercept	$y = mx + b$
Slope and a point	point-slope	$y - y_1 = m(x - x_1)$
Two points	point-slope	$y - y_1 = m(x - x_1)$

Find an equation of a line parallel to  $y = 2x - 3$  that contains the point  $(-2, 1)$ . Write the equation in slope-intercept form.

$$m = 2$$

$$y - 1 = 2(x + 2) \quad y = 2x + 5$$

$$y - 1 = 2x + 4$$

Find an equation of a line parallel to  $y = \frac{1}{2}x - 3$  that contains the point  $(6, 4)$ . Write the equation in slope-intercept form.

$$y - y_1 = \frac{1}{2}(x - x_1)$$

$$y - 4 = \frac{1}{2}(x - 6)$$

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

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

Find an equation of a line perpendicular to  $y = 2x - 3$  that contains the point  $(-2, 1)$ . Write the equation in slope-intercept form.

$$m = -\frac{1}{2}$$

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

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

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

Find an equation of a line parallel to  $y = -\frac{3}{4}x - 3$  that contains the point  $(6, 4)$ . Write the equation in slope-intercept form.

$$y - 4 = -\frac{3}{4}(x - 6)$$

$$y - 4 = -\frac{3}{4}x + \frac{18}{4}$$

$$y = -\frac{3}{4}x + \frac{17}{2}$$

$$m = \frac{4}{3}$$

$$y - 4 = \frac{4}{3}(x - 6)$$

$$y - 4 = \frac{4}{3}x - 8$$

$$y = \frac{4}{3}x - 4$$

Find an equation of a line perpendicular to  $x = 5$  that contains the point  $(3, -2)$ . Write the equation in slope-intercept form.

$$m=0$$

$$y + 2 = 0(x - 3)$$

$$y + 2 = 0$$

$$y = -2$$

Find an equation of a line perpendicular to  $y = 5$  that contains the point  $(-4, 2)$ .

$$\rightarrow m=0$$

undefined

$$x = -4$$