

3 - 4

Equations of Lines

slope-intercept form:

$$y = mx + b$$

$m = \text{slope}$

$b = \text{y-intercept}$

Write each of the following in slope-intercept form.

Ex: slope $\frac{1}{2}$, y-intercept - 6

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

Ex: slope - 4, y-intercept 2

$$y = -4x + 2$$

point-slope form:

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

$m = \text{slope}$

(x_1, y_1) is a point

Write the following in point-slope form.

Ex: slope $-\frac{1}{2}$, passes through $(4, -7)$

$$y + 7 = -\frac{1}{2}(x - 4)$$

*****now put into slope-intercept form**

$$\begin{aligned} y + 7 &= -\frac{1}{2}x + 2 \\ -7 & \quad -7 \\ y &= -\frac{1}{2}x - 5 \end{aligned}$$

Write the following in slope-intercept form.

a line that passes through $(-1, 6)$ and $(3, 2)$

$$m = \frac{6-2}{-1-3} = \frac{4}{-4} = -1$$

$$y - 2 = -1(x - 3)$$

$$\begin{array}{r} y - 2 \\ + 2 \end{array} = \begin{array}{r} -x + 3 \\ + 2 \end{array}$$

$$y = -x + 5$$

Ex: write the slope-intercept form of a line containing $(2,0)$ that is perpendicular to the line $y = -\frac{1}{2}x + 5$

$$\perp m = 2$$

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

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

$$y = 2x - 4$$

Ex: Jenny's current cell phone plan charges \$14.95 per month and \$0.10 per minute of airtime. Write an equation to represent her total monthly cost (c) for t minutes of airtime.

$$C = 14.95 + .10L$$

An alternate plan charges \$19.95 per month and \$0.07 per minute. Write an equation to represent her total monthly cost (c) for t minutes of airtime.

$$C = 19.95 + .07t$$

If she uses an average of 40 minutes per month, which is the better plan?

current

$$C = 14.95 + .10(40)$$

$$C = \$18.95$$

alternate

$$C = 19.95 + .07(40)$$

$$C = \$22.75$$