4.2 Use Linear Equations in Slope-Intercept Form

Solve for y!

$$y = mx + b$$

Write an equation of the line in slope-intercept form that passes through the point (-1,3) and has a slope of -4. m

$x_1 \, y_1$

$$y - y_1 = m(x - x_1)$$
$$y - 3 = -4(x + 1)$$
$$y - 3 = -4x - 4$$
$$\underline{ +3 \qquad\qquad +3}$$
$$\boxed{y = -4x - 1}$$

Write an equation of the line in slope-intercept form that passes through the point (6,3) and has a slope of -2. m

$x_1 \, y_1$

$$y - y_1 = m(x - x_1)$$
$$y - 3 = -2(x - 6)$$
$$y - 3 = -2x + 12$$
$$\underline{ +3 \qquad\qquad +3}$$
$$\boxed{y = -2x + 15}$$

Write an equation of the line in slope-intercept form that passes through the point (-3,-11) and has a slope of $\frac{1}{2}$. m

$$x_1 \quad y_1$$

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

$$y + 11 = \frac{1}{2}(x + 3)$$

$$y + 11 = \frac{1}{2}x + \frac{3}{2}$$

$$-11 \qquad\qquad -11 \quad -\frac{22}{2}$$

$$\boxed{y = \frac{1}{2}x - \frac{19}{2}}$$

Write an equation of the line in slope-intercept form that passes through $(\frac{9}{2}, 1)$ and $(-\frac{7}{2}, 7)$.

$$x_1 \, y_1 \qquad\qquad x_2 \, y_2$$

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

$$m = \frac{7 - 1}{-\frac{7}{2} - \frac{9}{2}} = \frac{6}{-8} = -\frac{3}{4}$$

$$y - 1 = -\frac{3}{4}\left(x - \frac{9}{2}\right) \quad \text{or} \quad y - 7 = -\frac{3}{4}\left(x + \frac{7}{2}\right)$$

$$y - 1 = -\frac{3}{4}x + \frac{27}{8} \qquad\qquad y - 7 = -\frac{3}{4}x - \frac{21}{8}$$

$$+1 \qquad\qquad +1 + \frac{8}{8} \qquad +7 \qquad\qquad +7 + \frac{56}{8}$$

$$\boxed{y = -\frac{3}{4}x + \frac{35}{8}} \qquad\qquad \boxed{y = -\frac{3}{4}x + \frac{35}{8}}$$

Your gym membership charges $35 per month after an initial membership fee. Roger has paid a total of $250 after 6 months.

slope

$(6, 250)$

Months $

a) Write an equation that gives the total cost of a gym membership as a function of the length of membership.

$$y - y_1 = m(x - x_1)$$
$$y - 250 = 35(x - 6)$$
$$y - 250 = 35x - 210$$
$$\underline{+250 \qquad\qquad +250}$$
$$y = 35x + 40$$

b) Find the total cost of membership after 10 months.
$$y = 35(10) + 40$$
$$\boxed{y = \$390}$$

A BMX race track charges a membership fee and an entry fee per race. Deandre paid a total of $76 after 3 races. Chris paid a total of $124 after 7 races.

a) How much does the track membership cost?

b) What is the entry fee per race?

c) Write an equation that gives the total cost as a function of the number of races entered.