4.2 *Use Linear Equations in Slope-Intercept Form*

$y = mx + b$

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

x_1, y_1

m

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

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

x_1, y_1

m

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

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

(x_1, y_1) m

$$y - y_1 = m(x - x_1)$$
$$y + 11 = \frac{1}{2}(x + 3)$$
$$y + 11 = \frac{1}{2}x + \frac{3}{2}$$
$$-11 \qquad -11$$
$$\boxed{y = \frac{1}{2}x - \frac{19}{2}}$$

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) (x_2, y_2)

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$
$$m = \frac{7 - 1}{-\frac{7}{2} - \frac{9}{2}} = \frac{6}{-8} = -\frac{3}{4}$$
$$y - y_1 = m(x - x_1)$$
$$y - 1 = -\frac{3}{4}\left(x - \frac{9}{2}\right)$$
$$y - 1 = -\frac{3}{4}x + \frac{27}{8}$$
$$+1 \qquad +1$$
$$\boxed{y = -\frac{3}{4}x + \frac{35}{8}}$$

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

m=35

money depends on time

y x

(6, 250)

x_1 y_1

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

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

$y - 250 = 35(x - 6)$

$y - 250 = 35x - 210$

$+250 \quad +250$

$y = 35x + 40$

b) Find the total cost of membership after 10 months.

x

$y = 35(10) + 40$

$y = 350 + 40$

$y = \$390$

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.

(3, 76)

x_1 y_1

money depends on races

y x

(7, 124)

x_2 y_2

a) How much does the track membership cost?

$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{124 - 76}{7 - 3} = \frac{48}{4} = 12$

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

$y - 76 = 12(x - 3)$

$y - 76 = 12x - 36$

$+76 \quad +76$

$y = 12x + 40$

$40

b) What is the entry fee per race?

$ / slope

$12

c) Write an equation that gives the total cost as a function of the number of races entered. $y = \$12x + 40$