

1. You are visiting Baltimore, MD and a taxi company charges a flat fee of \$3.00 for using the taxi and \$0.75 per mile.

- a. How much would a taxi ride for 8 miles cost?

$$y = .75x + 3$$

$$y = .75(8) + 3$$

$$y = 9 \text{ dollars}$$

9 dollars

- b. If a taxi ride cost \$15, how many miles did the taxi travel?

$$15 = .75x + 3$$

$$12 = .75x$$

$$x = 16$$

16 miles



2. A plumber charges \$50 to make a house call. He also charges \$25.00 per hour for labor.

- a. How much would it cost for a house call that requires 2.5 hours of labor?

$$y = 25x + 50$$

$$y = 25(2.5) + 50 = 112.50 \text{ dollars}$$

- b. If the bill from the plumber is \$162.50, how many hours did the plumber work at your house?

$$162.50 = 25x + 50$$

$$112.50 = 25x$$

$$x = 4.5 \text{ hours}$$



3. An airplane 30,000 feet above the ground begins descending at the rate of 2000 feet per minute. Assume the plane continues at the same rate of descent.
- a. Find the altitude of the plane after 5 minutes.

$$m = -2000$$

$$b = 30000$$

$$y = -2000x + 30000$$

$$y = -2000(5) + 30000$$

$$y = -10000 + 30000$$

$$y = \boxed{20000 \text{ feet}}$$



4. While on vacation in Washington DC, the cab ride for the Dulles airport to the hotel is 15 miles. The total cost of the cab ride was \$25.50. The cabbie charges \$1.50 per mile for the entire trip.

- a. What is the fixed fee for the cab ride?

3 dollars (this is b... the y-int)

$x = \# \text{ miles}$

$y = \text{dollars}$

$$y = mx + b \text{ or } y - y_1 = m(x - x_1)$$

- b. How much does it cost to travel 7 miles in a cab?

$$y = 1.50(7) + 3$$

$$y = \boxed{13.50 \text{ dollars}}$$

need m & b

given $m = 1.50$ (15, 25.5)

find b or use the

point/slope formula

25 given a point
(15, 25.50)

$$y = mx + b$$

$$25.50 = 1.50(15) + b$$

$$25.50 = 22.50 + b$$

$$b = 3$$

$$\boxed{y = 1.5x + 3}$$



5. Julio plans a diet to lose 0.2 kg a day. After 14 days he weighs 60 kg. The number days he diets and his weight are related.

b. How long will it take Julio to reach his goal weight of 50 kg?

$$m = -0.2 \quad \text{pt. } (14, 60)$$

$$y = mx + b$$

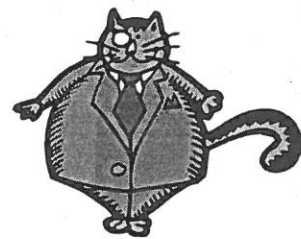
$$60 = -0.2(14) + b$$

$$60 = -2.8 + b$$

$$b = 62.8$$

$$y = -0.2x + 62.8$$

$$x = \text{days} \quad y = \text{kg}$$



$$50 = -0.2x + 62.8$$

$$-12.8 = -0.2x$$

$$x = \boxed{64 \text{ days}}$$

6. Your gym membership costs \$33 per month after an initial membership fee. You paid a total of \$228 after 6 months.

a. Find the total cost after 12 months.

$$x = \text{months} \quad y = \text{dollars}$$

$$m = 33 \quad \text{pt. } (6, 228)$$

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

$$y - 228 = 33(x - 6)$$

$$y - 228 = 33(12 - 6)$$

$$y = 198 + 228$$

$$y = \boxed{426 \text{ dollars}}$$

Why not just double the \$228?



7. All tickets for a concert are the same price. The ticket agency adds a fixed fee to every order. A person who orders 5 tickets pays \$67. A person who orders 3 tickets pays \$43.

- a. How much do 10 tickets cost?
 b. How many tickets can I buy with \$100?



$$m = \frac{67 - 43}{5 - 3} = \frac{24}{2} = 12$$

7 tickets

$$y - 43 = 12(x - 3)$$

$$y - 43 = 12(10 - 3)$$

$$y = 120 - 36 + 43 = \boxed{127 \text{ dollars}}$$

$$100 - 43 = 12(x - 3)$$

$$57 = 12x - 36$$

$$93 = 12x$$

$$x = 7.75$$

8. Biologists have found that the number of chirps some crickets make per minute is related to temperature. The relationship is very close to being linear. When crickets chirp 124 times a minute, it is about 68°F. When they chirp 172 times a minute, it is about 80°F.

- a. How warm is it when the crickets are chirping 150 times a minute?

$$y = mx + b$$

$$y = 4x - 148$$

$$150 = 4(x) - 148$$

$$298 = 4x$$

$$x = \boxed{74.5 \text{ } ^\circ\text{F}}$$

$$(68, 124) \quad x = ^\circ\text{F}$$

$$(80, 172) \quad y = \text{chirps}$$

$$m = \frac{172 - 124}{80 - 68} = 4$$

$$124 = 4(68) + b$$

$$124 = 272 + b$$

$$b = -148$$

- b. How many times will the crickets chirp per minute if it is 80°F?

172 times (see narrative)

$$y = 4(80) - 148$$

$$y = 320 - 148 = \boxed{172 \text{ chirps}}$$

