

3. Delivery Problem. Bill Dupp's Lumber Yard charges \$.50 for each cubic foot (ft^3) of sand you buy, plus \$6.00 to deliver the sand. So the total number of dollars you pay is 0.50 times the number of cubic feet, plus 6.

(a). Let x be the number of cubic feet.

← The variable is defined in words.

Then write an expression for the number of dollars you pay for $x \text{ ft}^3$ of sand, delivered.

(b). How much would you pay to get 258 ft^3 delivered?

(c). Write an equation stating that you pay \$17.50 to get $x \text{ ft}^3$ of sand delivered. Then solve the equation for x .

(d). How much sand could you get, delivered, for \$100?

4. Plumbers' Wages Problem. Drane and Route Plumbing Co. charges \$42 per hour, plus \$35 for the service call.

(a). Let x be _____

← Define the variable in words.

Then write an expression for the number of dollars you must pay if they work for x hours.

(b). How much would you pay for:

i. 3 hours;

ii. $4\frac{1}{2}$ hours?

(c). Write an equation stating that the amount you pay is \$140. Then solve the equation to find out how long they worked.

(d). How long did they work if the bill is \$56?

5. Taxi Fare Problem. When you flag a taxi, you get an initial charge of \$3.25. As the taxi travels, \$1.80 is added for each mile driven.

(a). Let x be _____ ← Define the variable in words.

Then write an expression for the number of dollars the meter reads after x mi.

(b). How much would you pay to ride:

i. 5 mi;

ii. 13 mi?

(c). Write an equation stating that you paid \$18.40. Then solve the equation to find out how far you rode.

(d). How far could you ride for \$33.20?

6. Dump Truck Problem. Doug Upp must shovel a pile containing 50 ft^3 of sand into a dump truck. With each scoop, he decreases the size of the pile by $\frac{1}{6} \text{ ft}^3$.

(a). Let x be the number of scoops he has shoveled. ← Define the variable in words.

Then write an expression for the number of cubic feet of sand left in the pile after x scoops.

(b). How much sand is left after:

i. 12 scoops;

ii. 100 scoops?

(c). Doug takes a rest when 20 ft^3 of sand remain. Write an equation stating that 20 ft^3 remain. Then solve the equation to find out how many scoops Doug has shoveled before he rests.

7. Gasoline Consumption Problem. Suppose that the gas tank of a car holds 12 gallons, and that the car uses $\frac{1}{20}$ of a gallon per mile.

- (a). Let x be the number of miles the car has gone since the tank was filled. ← The variable is defined in words.

Then write an expression for the number of gallons left after x miles.

- (b). How many gallons are left after:

i. 100 mi;

ii. 170 mi?

- (c). Write an equation stating that 5 gallons are left. Then solve it to find out how far the car has gone when 5 gallons remain.

- (d). How far has the car gone when it runs out of gas?

8. Food Consumption Problem. According to studies conducted during World War II, a working person consumes 30 fewer calories (cal) per day for each 1° rise in the Celsius temperature. Suppose that a person consumes 3600 cal per day at 0°C .

- (a). How many calories would the person consume at:

i. 1°C ;

ii. 5°C ;

- (b). Let T be the temperature in $^\circ\text{C}$. Write an expression for the number of calories consumed at $T^\circ\text{C}$. iii. $T^\circ\text{C}$, where T is a variable?

- (c). Evaluate the expression you wrote in part (b) if:

i. T is 21;

ii. T is -10 .

- (d). Write an equation stating that the consumption is 2400 cal. Then solve it to find the temperature.

- (e). At what temperature would the person consume 4200 cal?