

Equations and Inequalities

1.2 Applications Involving Linear Equations

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Procedure for Solving Word Problems

- ▶ **Step 1:** *Identify the question.* Read the problem one time and note what you are asked to find.
- ▶ **Step 2:** *Make notes.* Read until you can note something (an amount, a picture, anything). Continue reading and making notes until you have read the problem a second time.
- ▶ **Step 3:** *Set up an equation.* Assign a variable to represent what you are asked to find.
- ▶ **Step 4:** *Solve the equation.*
- ▶ **Step 5:** *Check the solution.* Run the solution past the "common sense department" using estimation.

Example (1)

During a camping trip in North Bay, Ontario, a couple went one-third of the way by boat, 10 miles by foot, and one-sixth of the way by horse. How long was the trip?

Step 1: How many miles was the trip?

The trip was 20 miles.

Example (2)

Find three consecutive even integers so that the sum of three numbers is 2 more than twice the third.

Step 1: What are the three consecutive even integers?

The three consecutive even integers are 4, 6, and 8.

Example (3)

A rectangle 24 meters long has the same area as a square with 12 meter sides. What are the dimensions of the rectangle?

Step 1: What are the dimensions (length and width) of the rectangle?

The rectangle is 24 meters long and 6 meters wide.

Definition (Simple Interest)

If a principal of P dollars is borrowed for a period of t years at an annual rate r (expressed in decimal form), the interest I charged is

$$I = Prt.$$

Example (4)

Through a summer job Morgan is able to save \$2,500. If she puts that money into a 6-month certificate of deposit (CD) that pays a simple interest rate of 3% a year, how much money will she have in her CD at the end of the 6 months?

Step 1: How much money does Morgan have after 6 months?

The interest paid on the CD is \$37.50. Adding this to the principal gives a total of $\$2,500 + \$37.50 = \$2,537.50$

Example (7)

It takes 8 hours to fly from Orlando to London and 9.5 hours to return. If an airplane averages 550 mph in still air, what is the average rate of the wind blowing in the direction from Orlando to London? Assume the speed of the wind (jet stream) is constant and the same for both legs of the trip.

Step 1: At what rate in mph is the wind blowing?

The wind is blowing approximately 47 mph in the direction from Orlando to London.