

Sections 2.4 & 2.5
An Introduction to Applications of Linear Equations
Formulas and Applications from Geometry

Solving an Applied Problem

Step 1 **Read** the problem carefully until you understand what is given and what is to be found.

Step 2 **Assign a variable** to represent the unknown value, using diagrams or tables as needed. Write down what the variable represents. If necessary, express any other unknown values in terms of the variable.

Step 3 **Write an equation** using the variable expression(s).

Step 4 **Solve** the equation.

Step 5 **State the answer** to the problem. Does it seem reasonable?

Step 6 **Check the answer** in the words of the original problem.

In class work : Solve each problem.
--

Problem #1 (2.4 - #9)

The sum of three times a number and 7 more than the number is the same as the difference between -11 and twice the number. What is the number? (A: -3)

Problem #2 (2.4 - #16)

The Toyota Camry was the top-selling passenger car in the United States in 2004, followed by the Honda Accord. Honda Accord sales were 40 thousand less than Toyota Camry sales, and 814 thousand of these two cars were sold. How many of each make of car were sold?

(A: 427,000 Camry, 387,000 Accord)

Problem #3 (2.4 - #29)

Nagaraj Nanjappa has a party-length submarine sandwich 59 in. long. He wants to cut it into three pieces so that the middle piece is 5 in. longer than the shortest piece and the shortest piece is 9 in. shorter than the longest piece. How long should the three pieces be? (A: 15 in., 20 in., 24 in.)

Problem #4 (2.4 - #33)

In a triangle ABC, angles A and B have the same measure, while the measure of angle C is 60° larger than each of A and B. What are the measures of the three angles?

Problem #5 (2.4 - #45)

Find the measure of an angle such that the difference between the measures of its supplement and three times its complement is 10° .

Problem #6 (2.4 - #57)

If 6 is subtracted from the largest of three consecutive odd integers, with this result multiplied by 2, the answer is 23 less than the sum of the first and twice the second of the integers. Find the integers. (A: 15, 17, 19)

Problem #7

Find the width of a rectangle whose length is 6 in. and whose area is 40 sq in. (A: $6\frac{2}{3}$ in)

Problem #8

As dry air rises, it expands due to the lower atmospheric pressure, and as a result the air cools at the rate of approximately $5.4^\circ F$ for each 1,000 feet of increase in altitude (up to an altitude of approximately 40,000 ft). Thus, if the ground-level temperature is $46^\circ F$, the temperature at an altitude of A feet above the ground is given by the equation

$$T = 46 - 0.0054A$$

- (a) Determine the temperature at an altitude of 5,000 feet. (A: $19^\circ F$)
(b) Determine the altitude at which the temperature will be $32^\circ F$. (A: approx. 2,600 feet)

Problem #9

A jogger's heart rate N (in beats per minute) increases as his or her speed s (in feet per second) increases. A physiologist collects data on a particular jogger and finds that the equation

$N = 1.67s + 55$ seems to fit the data quite well. According to this model, what speed would produce a heart rate of 85 beats per minute? (A: 18 ft/sec)

Problem #10

The length of a rectangle is 7 more than twice its width. If the perimeter of the rectangle is 50cm, find the dimensions of the rectangle. (A: 6 cm by 19 cm)