Writing Multi-Step Equations

Steps to Writing an Equation

- Read the problem and <u>underline</u> or <mark>highlight</mark> the key pieces of information
- Choose a variable to represent the unknown you know the least information about
- Write an expression to represent any other unknowns using the variable you chose
- Write an equation using your chosen variable

Example One

The length of a rectangle is 4 times the width. The perimeter is 90 cm. Find the width and length.

Let $w = the\ width$
Let $4w = the\ length$

$$Perimeter = 2 \cdot width + 2 \cdot length$$
$$90 = 2w + 2(4w)$$

Example Two

In three basketball games Alexandra scored 18 points, 12 points and 15 points. If she wants to average 14 points, how many points does she need to score in her next game?

Let $p = $ number of points scored in her fourth game

$$Average = \frac{\text{Total number of Points}}{\text{Number of Games}}$$
$$14 = \frac{18 + 12 + 15 + p}{4}$$

Example Three

An algebra book weighs 6 oz. less than twice as much as a grammar book. If 5 algebra books weigh the same as 8 grammar books, how much does an algebra book weigh?

Let $w = $ weight of a grammar book

Let $2w - 6 = $ weight of an algebra book

$$\text{weight of 5 algebra books} = \text{weight of 8 grammar books}$$

$$5(2w - 6) = 8w$$

Try These

Write an equation to represent the real-world situation.

1. A DVD cost $3 more than a CD. Raymond bought five DVDs and two CDs. The total cost was $120. What was the price of a DVD?

2. A triangular pennant has two sides the same length. The third side is 9 in. shorter than either of the equal sides. The perimeter of the pennant is 57 in. How long is the shortest side?

3. Acme car rental agency charges a fee of $29 per day plus $0.15 per mile. Travel Ease car rental agency charges $20 per day plus $0.25 per mile. For a one day trip, at what mileage would the two rates be equal?

4. The length of a rectangle is 2 cm more than 5 times the width. The perimeter is 196 cm. Find the width and length.

5. Cindy wants an average of 80% in American History. Her current test grades are 74%, 83%, 78% and an 81%. What must she score on her fifth test so that she earns the grade she wants?

6. Together a computer, monitor and printer cost $1775. The monitor cost $300 less than the computer and the printer cost $50 more than the monitor. Find the cost of the printer.