IMPLEMENTATION: Solve the equation:

$$x + x + 2 = 42$$

$$2x + 2 = 42$$

$$2x + 2 - 2 = 42 - 2$$

$$2x = 40$$

$$\frac{2^1 x}{2^1} = \frac{40}{2}$$

$$x = 20 \quad \text{(first even integer)}$$

$$x + 2 = 20 + 2 = 22 \quad \text{(second even integer)}$$

EVALUATION: 20 and 22 are consecutive even integers and their sum is $20 + 22 = 42$.

Try These

1. Three times a number increased by 3 is equal to 30. Find the number.

2. A plumber wishes to cut a 51-inch pipe into three pieces so that each piece is 7 inches longer than the preceding one. Find the length of each piece.

3. The sum of two numbers is 25, and one number is four times the other number. Find the numbers.

4. A basketball team played 20 games and won two more games than it lost. Find the number of games the team won.

5. If one-third of a number is three less than $\frac{1}{2}$ of the number, find the number.

6. If two times a number minus six is equal to 20, find the number.

7. Forty calculators are placed into two boxes so that one box has 4 more calculators than the other box. How many calculators are in each box?

8. If the sum of three consecutive numbers is 39, find the numbers.

9. If the sum of two consecutive odd numbers is 48, find the numbers.

10. Find two numbers whose sum is 30 and whose difference is 6.

SOLUTIONS:

1. Let $x =$ the number; then

$$3x + 3 = 30$$

$$3x + 3 - 3 = 30 - 3$$

$$3x = 27$$

$$\frac{\cancel{3}^1 x}{\cancel{3}^1} = \frac{27}{3}$$

$$x = 9$$

2. Let $x =$ length of first piece; $x + 7 =$ length of second piece; $x + 14 =$ length of third piece; then

$$x + x + 7 + x + 14 = 51$$

$$3x + 21 = 51$$

$$3x + 21 - 21 = 51 - 21$$

$$3x = 30$$

$$\frac{\cancel{3}^1 x}{\cancel{3}^1} = \frac{30}{3}$$

$$x = 10 \text{ inches} \quad \text{(first piece)}$$

$$x + 7 = 10 + 7 = 17 \text{ inches} \quad \text{(second piece)}$$

$$x + 14 = 10 + 14 = 24 \text{ inches} \quad \text{(third piece)}$$

3.   Let $x =$ one number and $4x =$ the other number; then

$$x + 4x = 25$$

$$5x = 25$$

$$\frac{\cancel{5}^1 x}{\cancel{5}^1} = \frac{25}{5}$$

$$x = 5$$

$$4x = 4.5 = 20$$

4.   Let $x =$ the number of losses and $x + 2 =$ the number of wins; then

$$x + x + 2 = 20$$

$$2x + 2 = 20$$

$$2x + 2 - 2 = 20 - 2$$

$$2x = 18$$

$$\frac{\cancel{2}^1 x}{\cancel{2}^1} = \frac{18}{2}$$

$$x = 9 \quad \text{(number of losses)}$$

$$x + 2 = 9 + 2 = 11 \quad \text{(number of wins)}$$

5.   Let $x =$ the number; then

$$\frac{1}{3}x = \frac{1}{2}x - 3$$

$$\frac{\cancel{6}^2}{1} \cdot \frac{1}{\cancel{3}^1}x = \frac{\cancel{6}^3}{1} \cdot \frac{1}{\cancel{2}^1}x - 6 \cdot 3$$

$$2x = 3x - 18$$

$$2x - 3x = 3x - 3x - 18$$

$$-x = -18$$

$$\frac{-x}{-1} = \frac{-18}{-1}$$

$$x = 18$$

6. Let $x =$ the number; then

$$2x - 6 = 20$$

$$2x - 6 + 6 = 20 + 6$$

$$2x = 26$$

$$\frac{2^1 x}{2^1} = \frac{26}{2}$$

$$x = 13$$

7. Let $x =$ the number of calculators in the first box and $x + 4 =$ the number of calculators in the second box; then

$$x + x + 4 = 40$$

$$2x + 4 = 40$$

$$2x + 4 - 4 = 40 - 4$$

$$2x = 36$$

$$\frac{2^1 x}{2^1} = \frac{36}{2}$$

$$x = 18$$

$$x + 4 = 18 + 4 = 22$$

8. Let $x =$ first integer; $x + 1 =$ second integer; $x + 2 =$ third integer; then

$$x + x + 1 + x + 2 = 39$$

$$3x + 3 = 39$$

$$3x + 3 - 3 = 39 - 3$$

$$3x = 36$$

$$\frac{3^1 x}{3^1} = \frac{36}{3}$$

$$x = 12$$

$$x + 1 = 13$$

$$x + 2 = 14$$

9. Let $x =$ first odd integer and $x + 2 =$ second odd integer; then

$$x + x + 2 = 48$$

$$2x + 2 = 48$$

$$2x + 2 - 2 = 48 - 2$$

$$2x = 46$$

$$\frac{2^1 x}{2^1} = \frac{46}{2}$$

$$x = 23$$

$$x + 2 = 23 + 2 = 25$$

10. Let $x =$ one number and $30 - x =$ the other number; then

$$x - (30 - x) = 6$$

$$x - 30 + x = 6$$

$$2x - 30 = 6$$

$$2x - 30 + 30 = 30 + 6$$

$$2x = 36$$

$$\frac{2^1 x}{2^1} = \frac{36}{2}$$

$$x = 18$$

$$30 - x = 30 - 18 = 12$$