Lesson: 23

**Grade 9 Academic** 

**Unit/Chapter:** <u>Linear Equations</u>

## **Topic: <u>Equation Solving Strategies</u>**

## **t** homework check: <u>NPM 9</u> p. 210 # 2, 5, 6, 9, 10, 12, 14, 16

## *note:* <u>Equation Solving Strategies</u>

In order to solve an equation with variables on both sides of the equal sign, the variables must first be collected on the same side using inverse operations. If fractions appear, multiply each term by the lowest common multiple of the denominators to write an equivalent equation with integer coefficients. You can always check your solution using a formal left side, right side check by substituting the value into your unknowns.

a) Rob and Tony work for a moving company. If Rob can pack a house in 4 hours and Tony can pack a similar house in 5 hours, how long would it take them if they worked together?

**Step 1:** Let x be the amount of time to complete the packing if they work together.

- Step 2: Let  $\frac{x}{4}$  be the fraction of time it takes Rob to pack the house. Let  $\frac{x}{5}$  be the fraction of time it takes Tony to pack the house.
- Step 3: Write and solve an equation to represent the total time it takes if they work together. Since the total of work must be one complete job,

$$\frac{x}{4} + \frac{x}{5} = 1$$

$$\frac{x}{4}(20) + \frac{x}{5}(20) = 1(20)$$

$$5x + 4x = 20$$

$$9x = 20$$

$$\frac{9x}{9} = \frac{20}{9}$$

$$x = \frac{20}{9} hours$$

b) If a rectangle with sides (2x+3) and (4x-5) has a perimeter of 44 cm, find the dimensions of each side.

Step 1: Write an expression for perimeter.

$$P = 2(2x+3) + 2(4x-5)$$
$$P = 4x + 6 + 8x - 10$$
$$P = 12x - 4$$

Step 2: Write and solve an equation using the information provided. 12x - 4 = 44

$$12x - 4 + 4 = 44 + 4$$
$$12x = 48$$
$$\frac{12x}{12} = \frac{48}{12}$$
$$x = 4cm$$

Step 3: Find the dimensions required if x = 4 cm. 2x + 3 = 2(4) + 3 = 8 + 3 = 11cm 4x - 5 = 4(2) - 5 = 8 - 5= 3cm

**H** homework assignment: <u>NPM 9</u> p. 221 # 5 – 9, 11, 14, 21