Steps for Solving Applied Problems

1. Read the problem carefully (several times). Identify what you are looking for (i.e. what is the question asking). If possible determine realistic possibilities for the answer.

2. Assign a letter (variable) to represent what you are looking for. If necessary, explain the remaining unknown quantities in terms of this variable.

3. Make a list of known facts, and translate them into mathematical expressions (equalities or inequalities that may involve your variable). If possible/necessary draw a diagram or chart.

4. Solve the equation for the variable, then answer the question.

5. Check your answer with the facts of the problem. (If it agrees, you’re done, if it doesn’t go back and try again)

• Things that are often helpful for doing these problems:
  - \( D = r \cdot t \) (or variations like \( V = r \cdot t \))
  - For ‘Working Together’ problems, determine ‘what fraction of the job can Person do in 1 hour’

Examples

1. Ted is canoeing on a river whose current is 2 km/hour. First he travels upstream a distance of 5 km. Then he turns around and canoes downstream to his original starting point. Assume that Ted’s speed relative to the water is constant. If the round trip took 6 hours, what was Ted’s speed?

2. In order to remove water from a flooded basement, two pumps, are used. One is rated at 30 gallons/min and the other is rated at 50 gallons/min. After 20 minutes, the faster pump burns out, and the second pump finishes removing the water 1 hour later. How many gallons of water were removed from the basement?

3. Thelma and Louis own a little coffee shop. If she works alone it takes Thelma 3 hours to clean the coffee shop at the end of the day. If Louis works alone, it takes her 2 hours to clean the coffee shop at the end of the day. One Saturday they close at 5:00, and both women will work together to clean the coffee shop. When will they be done?