

Math 365 Lecture Notes Section 1.2 – Mathematics and Problem Solving

★ The Four Step Problem Solving Process

- **Step 1 - Understand the Problem**

- Can you state the problem in your own words?
- What are you trying to find or do?
- What are the unknowns?
- What information do you obtain from the problem?
- What information, if any, is missing or not needed?

As I was going to St. Ives
I met a man with seven wives.
Every wife had seven sacks,
Every sack had seven cats,
Every cat had seven kits,
Kits, cats, sacks, and wives,
How many were going to St. Ives? Mother Goose Nursery Rhyme

Sometimes there will be extraneous information, which is not needed to solve the problem.

Thanksgiving was on November 24, 1983.
Memorial Day was on May 28, 1984.
How many days were there between the two holidays?

What additional information would be helpful in answering this question?

1. _____
2. _____
3. _____

- **Step 2 - Devise a Plan**

- Look for a pattern.
- Examine related problems and determine if the same technique applied to them can be applied here.
- Examine a simpler or special case of the problem to gain insight into the solution of the original problem.
- Make a table.
- Make a diagram.
- Write an equation.
- Use guess and check.
- Work backwards.
- Identify a sub-goal.
- Use indirect reasoning.
- Use direct reasoning.

- Sample problems

1. Nikki is setting up tables for a luncheon. She has 25 small square tables that hold one person to a side.
 - a. If each table is separate, how many guests can be seated?
 - b. If there is one long row of 25 tables together, how many guests can be seated?
 - c. If 60 guests are invited, how many tables should be pushed together?

2. A Magic Square

Arrange the numbers 1 through 9 below so that every row, every column and the main diagonals have the same sum.

3. An elevator stopped at the middle floor of a building. It then moved up four floors and stopped. It then moved down six floors, and then moved up 10 floors and stopped. The elevator was now 3 floors from the top floor. How many floors does the building have?
4. At the beginning of a conference twenty people introduce themselves and shake hands with each person present. How many handshakes take place?

