

4.7 Solving Counting Problems p. 283

Name _____

Date _____

Goal: Solve counting problems that involve permutations and combinations.**Example 1:** Solving a permutation problem with conditions (p. 284)

Mr. Rice and some of his favourite students are having a group photograph taken. There are three boys and five girls. The photographer wants the boys to sit together and the girls to sit together for one of the poses. How many ways can the students and teacher sit in a row of nine chairs for this pose?

Example 2: Solving a combination problem involving cases (p.286)

A standard deck of 52 playing cards consists of 4 suits (spades, hearts, diamonds, and clubs) of 13 cards each.

- a) How many different 5-card hands can be formed?

b) How many different 5-card hands can be formed that consist of all hearts?

c) How many different 5-card hands can be formed that consist of all face cards?

d) How many different 5-card hands can be formed that consist of 3 hearts and 2 spades?

e) How many different 5-card hands can be formed that consist of at least 3 hearts?

f) How many different 5-card hands can be formed that consist of at most 1 black card?

When solving counting problems, you need to determine if _____ plays a role in the situation. Once this is established, you can use the appropriate permutation or combination formula. You can also use these strategies:

- Look for _____. Consider these first as you develop your solution.
- If there is a repetition of r of the n objects to be eliminated, it is usually done by _____
- If a problem involves multiple tasks that are connected by the word _____, then the Fundamental Counting Principle can be applied: _____ the number of ways that each task can occur.
- If a problem involves multiple tasks that are connected by the word _____, the Fundamental Counting Principle _____ apply; _____ the number of ways that each task can occur. This typically is found in counting problems that involve _____.