15.7
Combinations

Combination

an arrangement of items where order DOES NOT matter

- n: # of items available
- r: # of items chosen at a time

$$_nC_r = \frac{_nP_r}{_rP_r} = \frac{n!}{r!(n-r)!} \qquad 0 \leq r \leq n$$

$$Evaluate: {}_{10}C_4$$

EX 1

- There are 20 books on a reading list. In how many ways can you choose 4 books to read?

EX 2

- A DJ wants to select 5 songs from a CD that contains 12 songs. How many 5-song selections are there?

EX 3

- A standard deck of cards consists of 4 suits (clubs, diamonds, hearts and spades) of 13 cards each. How many 5-card hands can be dealt from the same suit?

EX 4

- In how many ways can a student select 6 courses from 7 electives and 5 core courses if 3 electives and 3 core courses must be taken?

EX 5

- A pizza menu allows you to select 4 toppings at no extra charge from a list of 9 possible toppings. In how many ways can you select 4 or fewer toppings?

Determine whether you should use a combination or permutation. (Does order matter?) Then solve.

EX 6

- A chemistry teacher divides his class into eight groups. Each group submits one drawing for the molecular structure of water. He will select four of the drawings to display. In how many different ways can he select the drawings?

EX 7

- You will draw winners from a total of 25 tickets in a raffle. The first ticket wins $100, the second wins $50, and the third wins $10. In how many different ways can you draw the three winning tickets?

Determine whether you should use a combination or permutation. (Does order matter?) Then solve.

Rate your Level of Understanding				
0	1	2	3	4

EX 8

- Four books must be placed in a row on a shelf. Ten books are available.

EX 9

- A committee must be formed consisting of 3 teachers and 3 students. Five teachers and 4 students are eligible to be selected.