

MATH 210 FINITE MATHEMATICS

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6.4 Permutations and Combinations

Definition 1: n -Factorial

For any natural number n

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Definition 2: Permutations

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Example 1: Permutations

Eight horses are entered in a race. How many ways first, second, and third place results are there?

Example 2: Permutations

Jack, Jill, and five of their friends go to the movies. They all sit next to each other in the same row. How many ways can this be done?

Example 3: Permutations

Find the number of ways a president, vice president, secretary, and treasurer can be chosen from a committee of ten members?

Definition 3: Combinations

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Example 4: Combinations

Suppose you order three scoops of ice cream at Baskin-Robbins? Assuming you want three different types of ice cream, how many different ways can you do this?

If you were to buy one of these combinations a day, how long would it take to eat each one?

Example 5

You are play a trading card game that has 30 cards. You have 25 regular and 5 rare cards.

1. If you randomly select 8 cards, how many samples have two rare cards?
2. How many will have at least 7 regular cards?
3. How many will have at least 1 rare card?

Example 6

Suppose we have a bag of M&Ms containing 6 blue, 3 red, and 7 green. You choose 5 at random.

1. How many samples of 5 pieces can be chosen? Do the colors matter?

2. How many samples are there in which all are green?

3. How many samples are there in which 2 are blue and 1 is red?