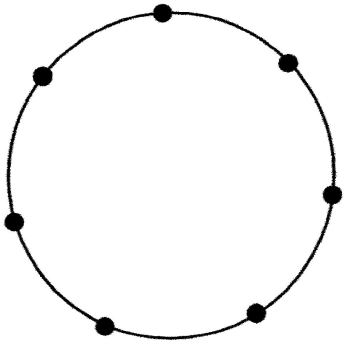
Bellwork Alg 2 Tuesday, May 26, 2020

Find the number of outcomes in each situation.

1. There are seven equally spaced points around this circle:



How many segments can be created by connecting two of these points?

2. You are playing cards with a friend. You are dealt 6 cards.

a) How many ways can you arrange these 6 cards in your hand?

b) When it's your turn you take three cards out of your hand and trade them in for three new cards. How many ways can you do this?

3. A password must contain three letters and three digits from 0-9. If letters can be repeated but digits can't, how many passwords are possible?

4. You are going to buy a new car. You've already decided the model and make of the car but need to pick a color, an accessory package, and an interior package. You have the following to choose from: 9 colors, 6 accessory packages, and 5 interior packages. How many different cars are possible given you must choose one color, one accessory package, and one interior package?

5. As a baseball coach you have to make a lineup each game that specifies the order in which each player will take their turn to hit. You have 12 players on the team but only nine of them can be in the lineup. How many different lineups are possible?

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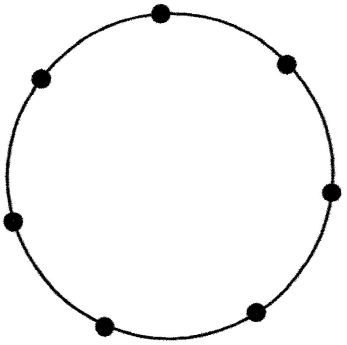
Answers

Find the number of outcomes in each situation.

1. There are seven equally spaced points around this circle:



How many segments can be created by connecting two of these points?

Since it doesn't matter what order you connect 2 points, it will be the same segment, this is a Combination.

$_7C_2 =$ 21 different segments

2. You are playing cards with a friend. You are dealt 6 cards.

a) How many ways can you arrange these 6 cards in your hand?

Since you are arranging ALL of these cards

either $6!$ or $_6P_6 =$ 720 ways

b) When it's your turn you take three cards out of your hand and trade them in for three new cards. How many ways can you do this?

order DOESN'T matter in this situation

so it's a Combination

$_6C_3 =$ 20 ways

3. A password must contain three letters and three digits from 0-9. If letters can be repeated but digits can't, how many passwords are possible?

use mult. count. princ.

$$\frac{26}{\text{letter}} \cdot \frac{26}{\text{letter}} \cdot \frac{26}{\text{letter}} \cdot \frac{10}{\#} \cdot \frac{9}{\#} \cdot \frac{8}{\#}$$

$=$ 12,654,720 different passwords

4. You are going to buy a new car. You've already decided the model and make of the car but need to pick a color, an accessory package, and an interior package. You have the following to choose from: 9 colors, 6 accessory packages, and 5 interior packages. How many different cars are possible given you must choose one color, one accessory package, and one interior package?

use mult. count. princ.

$$\frac{9}{\text{colors}} \cdot \frac{6}{\text{access. pkg}} \cdot \frac{5}{\text{interior pkg}} = 270 \text{ different cars}$$

5. As a baseball coach you have to make a lineup each game that specifies the order in which each player will take their turn to hit. You have 12 players on the team but only nine of them can be in the lineup. How many different lineups are possible?

since order is important this is a permutation

$$_{12}P_9$$

$$= 79,833,600 \text{ possible different line ups}$$