

Lecture Examples

Ex 1 A serial number for a phone has 5 letters followed by 2 numbers.

(a) How many phones can the manufacturer produce before they have to reuse a serial number?

(b) What if they want all of their serial numbers to never repeat a letter?

Ex 2 A homeowner interviews 6 people for a 3-bedroom house. How many different choices of pairings of people with bedrooms are there?

Ex 3 (a) How many possible 4-digit passcodes can you make for your phone?

(b) How many 6-digit?

(c) 10-digit?

(d) What if you want a 10-digit passcode to never repeat a digit?

On-Your-Own Examples

Ex 1 A person tosses a nickel, a dime, and a quarter. How many different possible outcomes are there? Construct a tree diagram depicting all the possible outcomes.

Ex 2 There are 8 people traveling together. How many ways can they be lined up for a picture?

Ex 3 A group of friends is ordering a one-topping pizza. The sizes available are small, medium and large, the sauces are tomato or pesto, and the topping choices are: cheese, sausage, pepperoni, or veggies. How many different pizzas could they order?

Ex 4 A soccer coach chooses 4 people to go on the field and take 4 different positions. How many possible choices are there?

Ex 5 A CEO has 11 managers to choose from but only 3 different executive positions to fill. How many possible executive teams are there?

Ex 6 The serial number on a new twenty-dollar bill consists of two letters followed by eight digits and then a letter. How many different serial numbers are possible, given the following conditions?

(a) Letters and digits cannot be repeated.

(b) Letters and digits can be repeated.

(c) The first and last letters are vowels and could have repeats, but the second letter is a consonant, and the digits can be repeated.

Ex 7 How many license plates are there for a particular state if license plates have

(a) six alpha-numeric characters?

(b) 3 numbers followed by 3 letters?

(c) 3 numbers followed by 3 letters with no repeats?

Ex 8 Sally eats 10 different kinds of fruit: watermelon, apples, bananas, oranges, grapes, raspberries, blackberries, blueberries, cherries, and strawberries. She wants to choose one different type of fruit for lunch each weekday. How many possible ways can she do it?