

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?