

## PROBLEM SET XII

1. For her winter vacation, Theresa packed three pairs of shoes, two pairs of pants, four shirts, and six dresses. How many different complete outfits does Theresa bring (assuming a complete outfit is either a pair of matching shoes, pair of pants and shirt, or a dress and matching pair of shoes).
2. Peter would like to bake cookies, and needs 4 cups to do so. He has two measuring cups, one that is 3 cups and one that is 5 cups. He wants to borrow the flour from his neighbor Matthew, who has an 8 cup container full of flour. No one has any other measuring cups. How can Peter get the required amount of flour?
3. A pirate is trying to get to a treasure chest. Between the pirate and the treasure chest are an ocean, a jungle, and a mountain. The pirate can cross the ocean in a boat or a raft. He can go through the jungle on horse, on foot, or on roller skates. He can cross the mountain by sky lift, hiking, or going around. How many different paths can the pirate take to get to the treasure?

4. Suppose you are playing a card game with a fair deck such that you have **two cards** in your hand.

(a) How many ways can you get a king and a queen?

(b) How many ways can you get a pair?

5. Suppose you are playing a card game with a fair deck such that you have **three cards** in your hand.

(a) How many ways can you get a king, a queen, and a jack?

(b) How many ways can you get a king, a queen, and a jack, all of the same suit?

(c) How many ways can you get three of a kind?

6. Suppose you are playing a card game with a fair deck such that you have **five cards** in your hand.

(a) How many ways can you get four aces and a king?

(b) How many ways can you get two kings and any other three cards?

(c) How many ways can you get five in a row?