**Chapter 7: 7.2 Making Decisions**

Many decisions are based on probabilities. For example, if the weather report stated that it was a 70% chance of precipitation you might decide to take an umbrella with you that day.

Probabilities based on known facts can be used to help make decisions. These probabilities are known as **theoretical probabilities**.

Imagine that you toss that same coin 20 times. How many times would you expect it to land on heads? You might say, 50% of the time, or half of the 20 times. So you would expect it to land on heads 10 times. This is the theoretical probability.   
  
The **theoretical probability** is what you **expect to happen**, but it isn't always what actually happens.

**Example:**

Emily is deciding to buy a lottery ticket sold by a charitable organization or to make a donation. To determine the risks and rewards, she inquires about buying a ticket versus making a donation and she learns the following.

Each ticket costs $100

100 000 tickets are sold

There are 50 value prizes to be won

Of the $100 $25 goes to charity and the rest goes to pay for prizes

1. The theoretical probability of buying a winning ticket is

# of prizes /# of tickets sold

50 / 100 000 = 0.0005

The theoretical probability is 0.0005 of winning.

Complete questions 1 – 7 on page 131

**Questions 3 is to be completed and handed in.**