FST Name:

Notes 7.2 Date: Block:

***7.2 Intro to Probability***

At the heart of probability theory is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Rolling a die, flipping a coin, drawing a card and spinning a game board spinner are all examples of \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. In a random process no individual event is predictable, even though the long range pattern of many individual events often is predictable.

|  |  |
| --- | --- |
| Probability | Is defined as the ratio of the…. To the  |

****Ranges from \_\_\_\_\_ to \_\_\_\_\_.

|  |
| --- |
| **Types of Probability**  |
| **Experimental** |  |
| **Theoretical** |  |

**Calculating Probabilities**

When calculating the probability of something happening, the “something” is called an \_\_\_\_\_\_\_, and the probability of the event happening is written \_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Ex. 1a) The probability of rolling a 3 on a die would be written \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Ex. 1b) The probability of winning the lottery would be written \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Probabilities are always expressed as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. The probability of an event that is certain to happen is \_\_\_, while the probability of an impossible event is \_\_\_.

To calculate a probability, you count the \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and divide this number by the total \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Probability of an event: P(E) =

Example of Theoretical Probability

Ex. 2) A bag contains 4 blue marbles, 6 green marbles and 3 yellow marbles. A marble is drawn at random from the bag.

 a) What's the probability of drawing a green marble?

 b) What's the probability of drawing a yellow marble?

 c) What's the probability of drawing a green OR yellow marble?

Example of Experimental Probability

Ex. 3) Suppose a study of car accidents and drivers who use mobile phones produced the following data:

|  |  |  |  |
| --- | --- | --- | --- |
|  | Had a car accidentin the last year | Did not have a car accidentin the last year | Totals |
| Driver using mobile phone | 45 | 280 | 325 |
| Driver not using mobile phone | 25 | 405 | 430 |
| Totals | 70 | 685 | 755 |

This type of table is called a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

The total number of people in the sample is \_\_\_\_\_\_. The row totals are \_\_\_\_\_\_ and \_\_\_\_\_\_.

The column totals are \_\_\_\_ and \_\_\_\_\_. Notice that 325 + 430 = \_\_\_\_\_, and 70 + 685 = \_\_\_\_\_.

**Example.** Calculate the following probabilities using the table above:

a) P(a driver is a mobile phone user) = b) P(a driver had no accident in the last year) =

 c) P(a driver using a mobile phone had no accident in the last year) =

**Practice:** Nine pieces of paper with the numbers 1, 2, 2, 3, 4, 4, 5, 6, and 6 printed on them are placed in a bag. A student chooses one without looking…

a) What is the probability of choosing a number 1? b) What is the probability of choosing a number 4?

c) What is the probability of choosing an odd number? d) What is the probability of choosing an odd number or a 6?

**Practice.** The following (incomplete) table shows a random sample of 100 hikers and the areas of hiking they prefer:

a) What is the probability that a hiker is a female? b) What’s the probability that a coastline hiker is a female?

c) What’s the probability a male hiker prefers to hike on mountain peaks?