Notes 3.2 Conditional Probability and the Multiplication Rule

I. Conditional Probability

This is denoted by _____ and is read as _____.

Example 1: Use the table below to find the following probabilities:

	Rides bus	Drives	Other
Freshmen	25	0	17
Sophomores	19	2	12
Juniors	15	7	11
Seniors	12	13	9

a. What is the probability of choosing a freshman?

b. What is the probability of choosing a person that drives to school?

c. What is the probability that a student drives to school, given they are a junior?

d. What is the probability that a student is a freshmen, given they ride the bus to school?

e. P(senior)

f. P(other|freshmen)

g. P(sophomore|drive)

II. Independent Events

Events that are not independent are **dependent.**

Example 2:

Decide whether the events are independent or dependent.

a. Practicing the piano (A) and then becoming a concert pianist (B).

b. Tossing a coin and getting a tail (A), and then rolling a six-sided die and obtaining a 3 (B).

c. A salmon swims successfully through a dam (A) & then swims successfully through a second dam (B).

d. Exercising frequently (A) and having a low resting heart rate (B).

e. Driving over 85 miles per hour (A), and then getting in a car accident (B).

Notes 3.2 Conditional Probability and the Multiplication Rule

III. The Multiplication Rule for the Probability of A and B

    If events A and B are dependent, then the rule for multiplication is _____.

    If events A and B are independent, then the rule for multiplication is _____

Example 3

  a. Two cards are selected without replacement from a standard deck of cards. Find the probability of selecting a king and then selecting a queen.

  b. A coin is tossed and a die is rolled. Find the probability of getting a tail and then rolling a 3.

  c. Suppose the probability of a salmon successfully swimming through a dam is 0.90.
    1. Find the probability that three salmon swim successfully through the dam.

    2. Find the probability that at least one salmon swims successfully through the dam.

  d. Two cards are selected without replacement from a standard deck of cards. Find the probability that they are both hearts.

Assignment: