

The table below summarizes results from an independent survey of 500 randomly selected college graduates who purchased a car within one year of graduation.

	<b>Economy</b>	<b>Mid-Size</b>	<b>Luxury</b>	<b>Total</b>
<b>New</b>	150	90	50	290
<b>Used</b>	150	35	25	210
<b>Total</b>	300	125	75	500

1.) If 1 of the 500 subjects is randomly selected, find the following:

a.  $P(\text{purchasing a new car})$ .

b.  $P(\text{not purchasing a luxury car})$ .

c.  $P(\text{purchasing a used car or a Mid-size car})$ .

d.  $P(\text{purchasing a luxury car or economy car})$ .

e.  $P(\text{purchasing a used car} \mid \text{it is an economy car})$

f.  $P(\text{New car and mid-size car})$ .

2.) A name brand refrigerator has a .05% defect rate.

a. If 20 refrigerators are randomly selected, find the probability that all 20 refrigerator are not defective.

b. If 5 refrigerators are randomly selected, find the probability that at least 1 refrigerator is not defective.

3.) If the sets A and B are mutually exclusive, then the  $P(A \text{ and } B) = ?$

**Pg. 2 Counting**

**4.)**

a. We want to paint three rooms in a house, each a different color and we may choose from seven different colors of paint. How many color combinations are possible for the three rooms?

b. Find the probability that all 3 rooms will be painted with the darkest colors?

**5.)** On Halloween night, a parent and child will go “trick or treating” but only to the houses on their block. Assuming that there are 15 houses on their block, including theirs, in how many ways can they go “trick or treating” if they do not go to the same house twice?

**6.)** A restaurant has 5 different types of salads, 8 different entrées, 8 different types of desserts and 10 different beverages.

How many different meals are possible if they select one of each category?

**7.)** How many different signals can be made by 5 flags from 8-flags of different colors?

**8.)** On a six question quiz with the first half consisting of true/false questions and the second half multiple choice questions with possible answers of A, B, C, D, E. Find the probability of getting the first 4 questions correct and the last 2 questions incorrect.

**9.)** In my bag I have 2 Black marker, 4 blue markers and 6 Red markers. Find the probability that if 3 markers are randomly selected, all the markers are of different color. Assume that the selections are done without replacement.

**10.)** The door prize at a party with 25 people is given by writing numbers 1 through 25 on the bottom of the paper plates used. What are the odds against winning the door prize?

**11.)** The following represents the number text messages an ELAC student receives in one minute while in their Math 227 class.

$x$	$P(x)$
0	0.08
1	0.15
2	0.35
3	0.32
4	
5	0.04

a. Explain how the given information can represent a probability distribution.

b. State the random variable.

c. Is it unusual to receive at least 4 text messages in one minute while in their Math 227 class? Explain your answer.

**12.)** A men's soccer team plays soccer 0, 1, or 2 days a week. The probability that they play 0 days is 0.2, the probability that they play 1 day is 0.5, and the probability that they play 2 days is 0.3. Find the long-term average,  $\mu$ , or expected value of the days per week the men's soccer team plays soccer.

**13.)** Suppose at UCLA 10% of students have high blood pressure. The others do not. If we randomly select 200 students from UCLA, find the following.

a. Find the probability that exactly 100 of them have high blood pressure.

b. Find the Mean.

c. Find the Standard Deviation.

d. Is it unusual for 25 of those students to have high blood pressure?

e. Use the **Normal approximation to Binomial** to determine the probability that at most 15 students have high blood pressure in a class of 200?

**14.)** A professor believes that if a class is allowed to work on an examination as long as desired, the times spent by the students would be approximately normally distributed with mean 70 minutes and standard deviation 5 minutes. What is the probability that a student will take between 60 minutes and 75 minutes to finish an exam?

**15.)** Given the information for problem #13, the Professor would like to end the exam when 90% of the students have turned in their exam, how much time should he allocate for the exam?

**16.)** The average GPA at a particular school is 2.89 with a standard deviation 0.63. A random sample of 55 students is collected. Find the probability that the average GPA for this sample is greater than 3.0.