

Math 221: Basic Statistics Exam #2A

Week #10

Name: _____

INSTRUCTIONS: You may use a calculator for this exam and a letter-sized study sheet with information written on a single side. You must show all of your work in order to receive full credit. Read each question carefully. Be certain that you have answered the question that was asked. Answers supplied as decimals must be accurate to *at least three decimal digits*.

Problem	Points	Score
1	14	
2	14	
3	14	
4	14	
5	14	
6	14	
7	14	
-	-	+2
Total	100	

- (1) A statewide survey was conducted to investigate the relationship between viewers' preferences for ABC, CBS, NBC and PBS for news information and their political party affiliation. The results are shown below.

	ABC	CBS	NBC	PBS	Total
Democrat	200	200	250	150	
Republican	450	350	500	200	
Other	150	400	100	500	
Total					

- (a) How many viewers were surveyed?
- (b) Why is this bivariate data? What type of variable is each one?
- (c) How many preferred to watch CBS?
- (d) What percentage of the survey was Republicans?
- (e) What percentage of the Democrats preferred ABC?

(2) Ice cream consumption (Y , pints per capita) was measured over 30 of four week periods from March 18th, 1951 to July 11th, 1953. It was thought that the mean temperature (X , $^{\circ}F$) might influence consumption. Excerpted are four of these periods with their corresponding X and Y values. Compute the correlation coefficient r and determine the regression line $\tilde{y} = mx + b$.

X	Y
41	.386
68	.425
61	.327
24	.256

(3) Suppose that a box of marbles contains an equal number of red marbles and yellow marbles but twice as many green marbles as red marbles.¹ One marble is drawn from the box and its color is observed.

(a) What is the sample space?

(b) Assign a probability to each element in the space.

¹No other marble colors.

(4) A college has an undergraduate enrollment of 3500. Of these, 860 are business majors and 1800 are women. Of the business majors, 425 are women.

(a) Fill in the following contingency table:

	Male	Female	Total
Business			
Other			
Total			

(b) Are the events “selecting a woman student” and “selecting a business major” mutually exclusive? Why?

(c) If a student is selected at random from this college, what is the probability that the student is “a woman **or** a business major”? (This is one question, not two!)

5-7 A person at a carnival has the opportunity to fish two prizes from a box. This box contains 3 \$1 prizes, 5 \$2 prizes, one \$10 prize and one \$100 prize.

(5) If the two prizes are selected from the box **with replacement**,

(a) List the total possible values of the two prizes.

(b) What are the probabilities of each of these values?

- (6) If the two prizes are selected from the box **without replacement**,
- (a) List the total possible values of the two prizes.

(b) what are the adjusted probabilities of each value?

- (7) Select either the “with replacement” or the “without replacement” problem. Then, put your answer in the probability distribution form (i.e., a table) and calculate the mean and variance.