

Name:

Elementary Statistics

HW 4.3

1. What is wrong with the expression  $P(A) + P(\bar{A}) = 0.5$ ?
2. A gambler plans to play the casino dice game called craps, and he plans to place a bet on the “pass line.” Let A be the event of winning. Based on the rules used in almost all casinos,  $P(A) = 244/495$ . Describe the event  $P(\bar{A})$  and find the value of  $P(\bar{A})$ .
3. For a Gallup poll, M is the event of randomly selecting a male and R is the event of randomly selecting a Republican. Are the events M and R mutually exclusive (disjoint)? Why or why not?
4. Determine if the following two events are mutually exclusive (disjoint) for a single trial.  
  
Hint: Mutually exclusive events are two separate events (cannot overlap).
  - a. Arriving late for your next statistics class.  
Arriving early for your next statistics class.
  - b. Randomly selecting a survey respondent and getting someone who believes in UFO's  
Randomly selecting a survey respondent and getting someone who believes in the devil.
5. According to the *National Association for College Admissions Counseling* and *USA Today*, 19.8% of college students take at least one class online. What is the probability of randomly selecting a college student who does NOT take any college courses online?
6. In a research experiment using the medication used in an EpiPen, one group of physicians were given bottles of epinephrine labeled with a concentration of “1 milligram in 1 milliliter solution.” Another group of physicians were given bottles labeled with a ratio of “1 milliliter of a 1:1000 solution.” The two labels describe the exact same amount and the physicians were instructed to administer 0.12 milligrams of epinephrine. The following table describes the numbers of correct and incorrect dosage amounts calculated by physicians.

	<u>Correct Dosage Calculation</u>	<u>Incorrect Dosage Calculation</u>
<u>Concentration Label</u>	11	3
<u>Ratio Label</u>	2	12

- a. If one of the physicians is randomly selected, what is the probability of getting one who calculated the dose incorrectly? Do you think this probability is as low as it should be?
  
- b. If one of the physicians is randomly selected, find the probability of getting one who made a correct dosage calculation or was given the bottle with the concentration label?
  
- c. If one of the physicians is randomly selected, find the probability of getting one who made an incorrect dosage calculation or was given the bottle with the ratio label?

7. A study was conducted to see how many people refused to answer survey questions based on various age groups. Use the table below to answer the questions that follow.

	Age 18-21	Age 22-29	Age 30-39	Age 40-49	Age 50-59	Age 60 and over
Responded	73	255	245	136	138	202
Refused	11	20	33	16	27	49

- a. What is the probability of randomly selecting one person from this study who refused to answer? Does that probability suggest that refusals are a problem for pollsters?
  
- b. What is the probability of randomly selecting one person from this study who is age 60 or older AND responded to the survey?
  
- c. What is the probability of randomly selecting one person from this study who responded to the survey OR is in the 18-21 age bracket?