

Math 110 Exam 2
July 22, 2004

Name _____

Show all of your work. Your answers must be justified.

Calculators Permitted.

1. TRUE-FALSE. Write TRUE or FALSE (not T or F) as appropriate.

- (a) If there are 20 items, there are more ways possible to select an unordered group of 5 of these items than to make a ranked list of 5 of these items.
- (b) If your score on an exam is the 60th percentile then you did better than the median score.
- (c) The salaries of American workers would likely be normally distributed.
- (d) For a normal distribution, the mean, the median, and the mode are all the same.

2. TRUE-FALSE. Write TRUE or FALSE (not T or F) as appropriate.

- (a) It is possible to have a probability larger than 1.
- (b) It is possible for the mean of a data set to be larger than the median.
- (c) It is possible for a z-score to be negative.
- (d) If 40% of all men support a particular candidate, and 40% of all women also support that candidate, then that candidate has the support of 80% of the people.

3. If a person randomly picks 2 cards from a deck (without replacement), what is the probability that both cards are hearts?

4. If a person randomly picks 2 cards from a deck (without replacement), what is the probability that at least one of them is an Ace?

5. A company randomly assigns computer passwords to its employees. The passwords are all 9 characters long, made up of 3 letters (a - z) followed by 5 digits (0 - 9) followed by a symbol which is either &, #, or \$. (for example, ece3692& or zak2222#) How many different computer passwords can this company assign?
6. What is the probability that a computer password randomly assigned by the company in question 5 begins with the letter 'g', has all of the digits the same, and ends with a dollar sign? (for example, gzx7777\$ or ggg0000\$)
7. There are 250 people attending a mental health conference. 100 of them are psychiatrists, 90 of them are psychologists, and 60 of them are social workers. (There is no overlap among the groups.) The conference organizers wish to create a discussion panel comprised of 5 psychiatrists, 4 psychologists, and 4 social workers. In how many ways can this be done?
8. Kim and Stan are two different people standing in a line of 50 people waiting to buy concert tickets. A local radio station announces that they will give free tickets to the person that is 15th in line and a free t-shirt to the person that is 30th in line. What is the probability that Kim will get the free tickets and Stan will get the free t-shirt?

9. Suppose that the following data is collected from a survey of 800 college students:

	Has chosen a major	Has not chosen a major
Freshman	90	110
Sophomore	100	100
Junior	150	50
Senior	190	10

What is the probability that a randomly chosen student in this survey has not chosen a major?

10. What is the probability that a randomly chosen student in the survey described in question 9 is a Junior or a Senior given that the student has not chosen a major?

11. You have a chance to get in on a stock deal that you can buy into for \$1000. After a careful analysis, you estimate that your chance of the stock going up is 40%, and the chance of the stock going down is 25%. Further, you estimate that your original \$1000 of stock will be worth \$10,000 if the stock goes up and will be worth \$0 if the stock goes down (and will be worth \$1000 if the stock stays the same). Based on these estimates, what is your expected value if you enter into this stock deal?

12. Consider the following frequency distribution

Value	Frequency
10	7
20	4
30	2
40	2
50	1
60	6

Calculate the mean of this data set.

13. Calculate the median of the data set in question 12.

14. The mean of the following data set is 4. Calculate the standard deviation.

1, 2, 3, 3, 6, 9

15. Which of the following two distributions has the largest standard deviation? (Assume the scaling on the axes is the same in both graphs.)



