

Math 112 Exam II Review

1. Determine whether a statement is true or false.
2. Use the best answer to complete a statement.
3. Construct a probability distribution for a family of three children. Let X represent the number of girls. **Draw a graph for the data.**
4. A concerned parents group determined the number commercials shown in each of five children's programs over a period of time. Find the mean, variance, and standard deviation for the distribution shown:

Number of commercials, X	5	6	7	8	9
Probability, $P(X)$	0.2	0.25	0.38	0.10	0.07

5. A lottery offers one \$1000 prize, one \$500 prize, and five \$100 prizes. One thousand tickets are sold at \$3 each. Find the expectation if a person buys two tickets. Assume that the player's ticket is replaced after each draw and the same ticket can win more than one prize.
6. If 20% of the people in a community use the emergency room at a hospital in one year, find these probabilities for a sample of 10 people:
 - (a) At most three used the emergency room.
 - (b) Exactly three used the emergency room.
 - (c) At least five used the emergency room.
7. In a survey, 58% of American adults said they had never heard of the Internet. If 20 American adults are selected at random, find the probability that exactly 12 will say they have never heard of the Internet.
8. Find the area under the normal distribution curve:
"To the right of $z = 1.92$ and to the left of $z = -0.44$ "

- 9.** A survey found that people keep their television sets an average of 4.8 years. The standard deviation is 0.89 year. If a person decides to buy a new TV set, find the probability that he or she has owned the old set for the following amount of time. Assume the variable is normally distributed.
- (a) Less than 2.5 years.
 - (b) Between 3 and 4 years.
- 10.** For a medical study, a researcher wishes to select people in the middle 60% of the population based on the blood pressure. If the mean systolic blood pressure is 120 and the standard deviation is 8, find the upper and lower readings that would qualify people to participate in the study.
- 11.** The average number of pounds of meat a person consumes a year is 218.4 pounds. Assume that the standard deviation is 25 pounds and the distribution is approximately normal. If a sample of 40 individuals is selected, find the probability that the mean of the sample will be less than 224 pounds per year.
- 12.** Of all 3- to 5-year-old children, 56% are enrolled in school. If a sample of 500 such children is randomly selected, find the probability that at least 250 will be enrolled in school.
- 13.** In a normal distribution, find σ when $\mu = 110$ and 2.87% of the data lies to the right of 112.
- 14.** In a certain normal distribution, 1.25% of the area lies to the left of 42, and 1.25% of the area lies to the right of 48. Find μ and σ .
- 15.** A study of 40 English composition professors showed that they spent, on average, 12.6 minutes correcting a student's term paper.
- (a) Find the 90% confidence interval of the mean time for all composition papers when $\sigma = 2.5$ minutes.
 - (b) If a professor stated that he spent, on average, 30 minutes correcting a term paper, what would be your reaction?
- 16.** The college president asks the statistics teacher to estimate the average age of the students at their college. How large a sample is necessary? The statistics teacher would like to be 99% confident that the estimate should be accurate within one year. From a previous study, the standard deviation of the ages is known to be 3 years.

- 17.** A recent study of 25 students showed that they spent an average of \$18.53 for gasoline per week. The standard deviation of the sample was \$3.00. Find the 95% confidence interval of the true mean.
- 18.** A survey of 200,000 boat owners found that 12% of the pleasure boats were named *serenity*. Find the 95% confidence interval of the true proportion of boats named *serenity*.
- 19.** A recent study indicated that 29% of the 100 women over 55 in the study were widows.
- (a) How large a sample must one take to be 90% confident that the estimate is within 0.05 of the true proportion of women over 55 who are widows?
- (b) If no estimate of the sample proportion is available, how large should the sample be?
- 20.** A random sample of stock prices per share is shown. Find the 90% confidence interval for the variance and standard deviation for the prices. Assume the variable is normally distributed.
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| \$26.69 | \$13.88 | \$28.37 | \$12.00 |
| \$75.37 | \$7.50 | \$47.50 | \$43.00 |
| \$3.81 | \$53.81 | \$13.62 | \$45.12 |
| \$6.94 | \$28.25 | \$28.00 | \$60.50 |
| \$40.25 | \$10.87 | \$46.12 | \$14.75 |