

## Statistics

Name \_\_\_\_\_

### Review #2 Unit 8

1. The amount of sugar used in a gallon of high-quality southern sweet tea is approximately normally distributed with a mean of 1.8 cups and a standard deviation of 0.4 cups.

a. What is the probability that a randomly selected gallon of tea will have at least 2.3 cups of sugar in it?

b. A random sample of 10 gallons of tea are selected, what are the mean and standard deviation of the sampling distribution?

c. Can you use the formula for standard deviation? Why or why not?

d. What is the shape of your sampling distribution? How do you know?

e. What is the probability that the average amount of sugar in 10 gallons of tea will be at least 2.3 cups?

2. A well-known food chain believes that 36% of their customers prefer to have the buns used on their sandwiches toasted. Suppose a simple random sample of 400 people are selected.

a. What is the mean and standard deviation of the sampling distribution  $\hat{p}$ , the proportion of customers preferring toasted sandwich buns?

b. Check to see if a normal curve is a reasonable approximation for this study.

c. What is the probability that fewer than 32% of the customers prefer to have their sandwiches on toasted buns?

3. The amount that households pay service providers for access to the Internet varies quite a bit, but the mean monthly fee is \$28 and the standard deviation is \$10. The distribution is not Normal; many households pay about \$10 for limited dial-up access or about \$30 for unlimited dial-up access, but some pay much more for faster connections. A sample survey asks an SRS of 500 households with Internet access how much they pay. Let  $\bar{x}$  be the mean amount paid.

a. Explain why you can't determine the probability that the amount a randomly selected household pays for access to the Internet exceeds \$29.

b. What are the mean and standard deviation of the sampling distribution of  $\bar{x}$ ?

c. What is the shape of the sampling distribution of  $\bar{x}$ ? Justify your answer.

d. Find the probability that the average fee paid by the sample of households exceeds \$29. Show your work.

4. According to government data, 22% of American children under the age of six live in households with incomes less than the official poverty level. A study of learning in early childhood chooses an SRS of 300 children.

a. What are the mean and standard deviation of the sampling distribution?

c. Can you use the formula for standard deviation? Why or why not?

d. What is the shape of your sampling distribution? How do you know?

e. Find the probability that more than 20% of the sample are from poverty households.