Algebra 2 Unit 7 Final Review   **Name:**

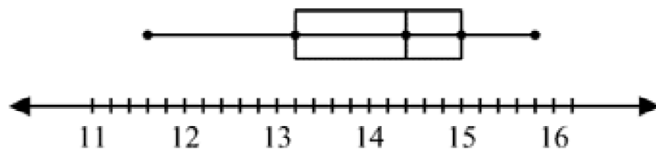## SHOW ALL WORK to receive credit.

1. Mike was in charge of collecting contributions for the Food Bank. He received contributions of $20, $100, $30, $20, and $60.
   Find the following:
   mean
   median
   mode
   range

2. Last year the Wolverine football team scored the following number of points in its 10 games.
   Number of points: 17, 7, 28, 21, 24, 35, 14, 10, 31, 20. Find the mean, the range, and the standard deviation of the data.

3. Explain what happens to the mean, the median, the mode, the range, and the standard deviation when the same constant value is added to each value in a data set.

4. Explain what happens when each value in a data set is multiplied by the same constant.

5. Last year, the personal best high jumps of track athletes in a nearby state were normally distributed with a mean of $208\,cm$ and a standard deviation of $15\,cm$ What is the probability that a randomly selected high jumper has a personal best of:
   a) between 223 and 238 cm
   b) at least 223 cm
   c) between 193 cm and 253 cm

6. Suppose the test scores on an exam show a normal distribution with a mean of 82 and a standard deviation of 5.
   a. Within what range do about 95% of the scores fall?
   b. About what percent of the scores are between 77 and 92?

7. When 900 voters were polled, 53% said they were voting *yes* on an initiative measure. Find the margin of error and the interval that is likely to contain the true population percent.

8. According to a recent survey, 45% of American teenagers in a random sample said they prefer thick crust pizza to thin crust. If the margin of error is $\pm 6\%$, about how many students were surveyed?

9. The mean age of the employees at a company is 40. The standard deviation of the ages is 3. Suppose the same people were working for the company 5 years ago. What were the mean and the standard deviation of their ages then?

Problems 13 - 15, determine which sampling method is used.

10. mail a response card

11. the first 40 students who enter the office

12. Identify the type of sample and describe the population of the survey. Then tell if the sample is potentially biased. Explain your reasoning. The first 50 students to arrive at school are surveyed.

13. Each year the junior class goes on a field trip. You want to poll the class to find out where they would like to go. There are 141 students in the junior class. Describe a method for selecting a random sample of 20 juniors.

14. The box-and-whisker plot represents the weights, in kilograms, of the 68 children at a preschool daycare center. About how many children at the center have weights between 13.2 kg and 14.4 kg?

15. Draw a box-and-whisker plot of the data:
    24, 16, 12, 28, 19, 21, 15

SHOW ALL WORK to receive credit.
Answer Section

1. mean = $46
   median = $30
   mode = $20
   range = $80
2. 20.7; 28; ≈ 8.58
3. Sample answer: When a constant value is added to every value in a data set, the mean and the median are translated by the constant value, while the range and the standard deviation remain the same.
4. The mean, median, range, and standard deviation are multiplied by the constant.
5. a) 13.5%
   b) 16%
   c) 83.85%
6. a. $72 \leq x \leq 92$
   b. about 81.5%
7. ±3.3%; between 49.7% and 56.3%
8. about 278 students
9. mean = 35, standard deviation = 3
10. self - selected
11. convenience
12. Sample answer: Convenience; the population is all students who attend the school; the sample is not biased, because the surveyor has no control over who arrives at school first.
13. Answers may vary. Sample answer: Make a list of all 141 juniors. Assign each junior a different integer from 1 to 141. Generate 20 unique random integers. Poll the 20 students that correspond to the 20 integers you generated.
14. There are about 17 children with weights in that range.
15. Answer: