Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

AP Statistics – Ms. Klimczuk

**Shifting and Rescaling Data Worksheet**

1. Let’s say we change units of data from inches to feet.
   1. Is this an example of *shifting* or *rescaling* data?
   2. What happens to the mean?
   3. What happens to the standard deviation?
   4. What happens to the median?
   5. What happens to the IQR?
   6. What happens to the shape of the distribution?
2. For car speeds, the mean speed recorded was 23.84 mph, with a standard deviation of 3.56 mph. To see how many cars are speeding, John subtracts 20 mph from all speeds.
   1. What is the mean and the standard deviation now? What does this tell us about the speed of the cars?
   2. His friend in Berlin wants to study the speeds, so john converts all the original miles-per-hour readings to kilometers-per-hour by multiplying all speeds by 1.609 (km per mile). What is the mean now? What is the new standard deviation?
3. In 1995, the Educational Testing Service (ETS) adjusted the scores of SAT tests. Before ETS recentered the SAT Verbal test, the mean of all test scores was 450.
   1. How would adding 50 points to each score affect the mean?
   2. The standard deviation was 100 points. What would the standard deviation be after adding 50 points?
   3. Suppose we drew boxplots of test takers’ scores a year before and a year after the recentering. How would the boxplots of the two years differ?
4. A company manufactures wheels for in-line skates. The diameters of the wheels have a mean of 3 inches and a standard deviation of 0.1 inches. Because so many of their customers use the metric system, the company decided to report their production statistics in millimeters (1 inch = 25.4 mm).
   1. What would be the new mean after converting to millimeters?
   2. What would be the new standard deviation after converting to millimeters?
   3. A corporate executive is worried about this increase in variation. Should he be concerned? Explain.