68-95-99.7 Rule

Workshop



1. In the normal distribution below, suppose that 95% of the data falls between 65 and 105. Find the mean μ and the standard deviation σ for this distribution.



2. On the verbal portion of the SAT, the mean score is about 500, and the standard deviation is 100. Draw and label a bell curve and mark the scores exactly 1, 2, and 3 standard deviations above and below the mean.

- 3. According to the 68-95-99.7 rule, what percent of a students taking the SAT will score 600 or higher on the SAT verbal test?
- 4. The **percentile** of a number in a dataset is always the *percent of data below the number*. Estimate the percentile of a student who scored a 600 on the SAT verbal test.
- 5. Estimate the percentile of a student who scores a 300 verbal on the SAT.

6. Below are the total rainfall amounts in Farmville, VA in inches for each year from 1931 to 2011, sorted from least to greatest.

27 32 32 33 34 34 35 36 36 36 36 36 37 37 38 39 39 39 39 39 40 40 40 40 41 41 41 41 41 41 41 41 42 42 42 42 42 42 43 43 43 43 44 44 44 44 44 45 45 46 46 46 46 46 47 47 47 47 47 47 47 48 49 49 49 49 49 50 50 50 50 52 52 52 52 56 56 57 57 58 58 60 62

(a) The standard deviation of this data is s = 7.0 inches and the mean is $\bar{x} = 44$ inches of rain. According to the normal distribution model, 68% of the data should be between what two numbers?

(b) Using the actual data, in how many years was the total rainfall more than one standard deviation above average? How many years was the rainfall less than the amount one standard deviation below the average?

(c) What percent of the 81 years in the dataset had rainfall amounts more than one standard deviation away from the mean? Does this match the prediction from the 68-95-99.7 rule? Is it close?

(d) What percent of the years had rainfall amounts more than two standard deviations away from the mean? Is that close to what the normal distribution model predicts?