**NOTES: Chapter 2.1 Measures of Relative Standing**

Consider the following test scores for a small class:

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **79** | **81** | **80** | **77** | **73** | **83** | **74** | **93** | **78** | **80** | **75** | **67** | **73** |
| **77** | **83** | **86** | **90** | **79** | **85** | **83** | **89** | **84** | **82** | **77** | **72** |  |

Jenny’s score is noted in red. How did she perform on this test relative to her peers?

* One way to describe relative position in a data set is to tell how many standard deviations above or below the mean the observation is.
* Standardized Value: “z-score”

If the mean and standard deviation of a distribution are known, the “z-score” of a particular observation, x, is:

**Calculating z-scores:**

According to Minitab, the mean test score was \_\_\_\_ while the standard deviation was \_\_\_\_\_ points.

Julia’s score was above average. Her standardized z-score is:

Kevin (72):

Kati (80):

**Comparing Scores:**

* Standardized values can be used to compare scores from two different distributions.
  + Statistics Test: mean = 80, std dev = 6.07
  + Chemistry Test: mean = 76, std dev = 4
  + Jenny got an 86 in Statistics and 82 in Chemistry.
  + On which test did she perform better?

Statistics: Chemistry:

**Percentiles:**

* Another measure of relative standing is a **percentile rank**.
* **pth percentile**: Value with p % of observations **at or** below it.
  + median =
  + Q1 =
  + Q3 =

**Density Curves:**

* **Density Curve:** An idealized description of the overall pattern of a distribution.
  + **Area underneath =**
* Density Curves come in many different shapes; symmetric, skewed, uniform, etc.
* The area of a region of a density curve represents the % of observations that fall in that region.
* The \_\_\_\_\_\_\_\_\_\_ of a density curve cuts the area in half.
* The \_\_\_\_\_\_\_\_ of a density curve is its “balance point.”

Ex: What % of the observations represented by the following density curve fall between .4 and .6? (see slide for picture)