

Algebra 2B Notes

Name: _____

11-6 Analyzing Data

Date: _____ Hr: _____

Objective:

- To calculate measures of central tendency.
- To draw and interpret box and whisker plots.

Common Core Content Standard:

S.MD.6 Use probabilities to make fair decisions.

S.MD.7 Analyze decisions and strategies using probability concepts ...

Take note

Key Concepts Measures of Central Tendency

Measure	Definition	Example, using 1, 2, 3, 3, 4, 5, 5, 9
Mean	$\frac{\text{sum of the data values}}{\text{number of data values}}$	$\frac{1 + 2 + 3 + 3 + 4 + 5 + 5 + 9}{8} = 4$
Median	for a data set listed in order: the middle value for an odd number of data values; the mean of the two middle values for an even number of data values	For 1, 2, 3, 3, 4, 5, 5, 9, the middle two values are 3 and 4. The median is their mean $\frac{3 + 4}{2} = 3.5$.
Mode	the most frequently occurring value(s)	Two modes: In 1, 2, 3, 3, 4, 5, 5, 9, both 3 and 5 occur twice.

A _____ data set has two modes. If a data set has more than two modes, then the modes are not statistically useful. If no value occurs more frequently than any other, then there is no mode.

Example 1: Finding Measures of Central Tendency

The frequency table shows the number of textbooks in several students' book bags.

Textbooks	0	1	2	3	4
Students	1	6	10	4	4

What are the mean, median, and mode for textbooks per student?

An _____ is a value that is substantially different from the rest of the data in a set. If the data is in one variable, outliers can occur at the "ends." They can be misleading because they can affect measures of central tendency.

Example 2: Identifying an Outlier

Which is an outlier for this data set?

22 35 12 28 46 30 31 15 19

The _____ of a set of data is the difference between the greatest and least values. If you order data from least value to greatest value, the median divides the data into two parts. The median of each part divides the data further and you have four parts in all. The values separating the four parts are _____. The _____ is the difference between the third and first quartiles.

Example 3: Comparing Data Sets

The table shows population density by square mile for counties in three of Florida's eight regions, according to the 2000 U.S. Census.

Southwest	Southeast	Central East
204.2	228.1	401.9
13.7	573.0	467.7
548.6	1346.5	224.4
31.4	1157.9	46.4
124.1	79.8	336.6

What are the mean, mode, range, quartiles, and interquartile range for the Southwest and Southeast population density data?

A _____ uses minimum and maximum values, the median, and the first and third quartiles to display the spread, or variability, in a data set.

Take note

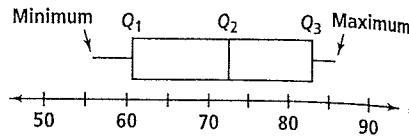
Key Concept Box-and-Whisker Plot

Definition

A box-and-whisker plot is a way to display data that uses

- quartiles to bound the center box and
- the minimum and maximum values to form the whiskers.

Graph



Example 4: Using a Box-and-Whisker Plot

What are the quartiles of the Central East region population density data in the preceding table? Use a graphing calculator box-and-whisker plot.

A _____ is a number from 0 to 100 that you can associate with a value x from a data set. It shows the percent of the data that are less than or equal to x . If x is at the 63rd percentile, then 63% of the data are less than or equal to x .

Example 5: Finding Percentiles

The data shows the number of hours in a week that students in a class spent doing homework. What value is at the 45th percentile?

0 3 4 4 4 4.25 4.5 4.5 4.75
5 5 5.25 5.5 5.5 6 6.25 6.25
6.5 7 9

