1.1 Honors Advanced Algebra DATE: _____

Target 9A: Analyzing Data

- **Measures of Central Tendency:**
  - Mean: average value
  - Medium: middle value
  - Mode: most frequency occurring value(s). Bimodal means data has two modes.
- **Range:** the difference between the greatest and least values given a set of data.
- **Quartiles:** the four parts that make up the range
- **Interquartile range:** the difference between the first and third quartiles.
- **Outlier**: a value that is substantially different from the rest of the data that can be misleading and affect the measure of central tendency.
- **Percentile**: 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.

Finding Measures of Central Tendency

Career **The frequency table shows the number of job offers received by each student within two months of graduating with a mathematics degree from a small college. What are the mean, median, and mode for the job offers per student?**

Job Offers	0	1	2	3	4
Students	2	2	4	5	2

Mean: The symbol , read " ," represents the mean.

The mean is

Median: List each value the number of times it occurs.
The median is Arrange them in order. Find the middle value.

Mode: students received job offers each. The mode is the number of job offers received
The mode is by most students.

Finding Percentiles

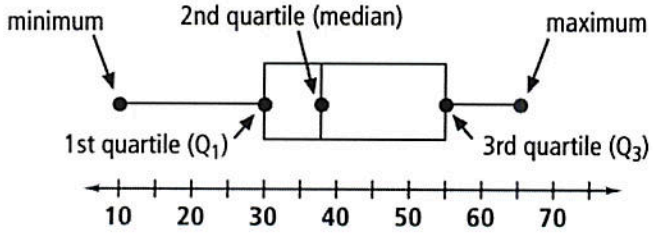
Testing **Here is an ordered list of midterm test scores for a Spanish class. What value is at the 65th percentile?**

41	54	61	65	67	73	74
77	77	77	79	80	82	88
89	93	97	98	98	100	

Of the values, 65% fall at or below the value at the 65th percentile.

values fall at or below , the value at the 65th percentile.

Box and Whisker Plot



Calculating Outliers: 1.5 X IQR Rule

- Suspected low outlier: any value $< Q_1 - 1.5 \times IQR$
- Suspected high outlier: any value $> Q_3 + 1.5 \times IQR$

Comparing Data Sets

Temperature: The tables shows average monthly water temperatures for four locations on the Gulf of Mexico. How can you compare the 12 water temperatures from St. Petersburg with the 12 water temperatures from Key West?

Gulf of Mexico Eastern Coast Water Temperatures (°F)

Location	J	F	M	A	M	J	J	A	S	O	N	D
St. Petersburg, Florida	62	64	68	74	80	84	86	86	84	78	70	64
Key West, Florida	69	70	75	78	82	85	87	87	86	82	76	72
Dauphin Island, Alabama	51	53	60	70	75	82	84	84	80	72	62	56
Grand Isle, Louisiana	61	61	64	70	77	83	85	85	83	77	70	65

Source: National Oceanographic Data Center

St. Petersburg:

$\bar{x}$ =

(mean water temperature)

Modes:

Min.: ; Max.: ; Range:

Median (Q_2) =

62 64 64 68 70 74 78 80 84 84 86 86

Median of lower part (Q_1) =

Median of upper part (Q_3) =

Interquartile range:
$Q_3 - Q_1$ =

Key West:

$\bar{x}$ =

(mean water temperature)

Modes:

Min.: ; Max.: ; Range:

Median (Q_2) =

69 70 72 75 76 78 82 82 85 86 87 87

Median of lower part (Q_1) =

Median of upper part (Q_3) =

Interquartile range:
$Q_3 - Q_1$ =

The range and the interquartile range show the temperatures varying at Key West than at St. Petersburg. Also, the temperatures at Key West are generally

Practice

1) Find the mean, median, and mode of each set of values

a. Time spent on Internet per day (in minutes): 75, 68, 43, 120, 65, 180, 95, 225, 140.

b.

Age (years)	13	14	15	16	17	18	19
Frequency	7	12	18	9	5	4	2

2) The table shows the average monthly temperatures of two cities. How can you compare the temperatures?

	J	F	M	A	M	J	J	A	S	O	N	D
Jacksonville, Florida	52.4	55.2	61.1	67.0	73.4	79.1	81.6	81.2	78.1	69.8	61.9	55.1
Austin, Texas	48.8	52.8	61.5	69.9	75.6	81.3	84.5	84.8	80.2	71.1	60.9	51.6

3) Make a box and whisker plot for each set of values:

a. 12, 11, 15, 12, 19, 20, 19, 14, 18, 15, 16

b. 120, 145, 133, 105, 117, 150, 130, 136, 128

4) Find the outlier(s), if any, of the following data sets:

a. 50, 60, 73, 77, 80, 81, 82, 83, 84, 84, 84, 85, 88, 95, 100

b. 10.2, 14.1, 14.4, 14.4, 14.4, 14.5, 14.5, 14.6, 14.7, 14.7, 14.7, 14.9, 15.1, 15.9, 16.4

5) Find the values at the 30th and 90 percentile for each data set.

a. 6283, 5700, 6381, 6274, 5700, 5896, 5972, 6075, 5993, 5581

b. 7, 12, 3, 14, 17, 20, 5, 3, 17, 4, 13, 2, 15, 9, 15, 18, 16, 9, 1, 6