

Algebra 2 Honors

Measures of Central Tendency

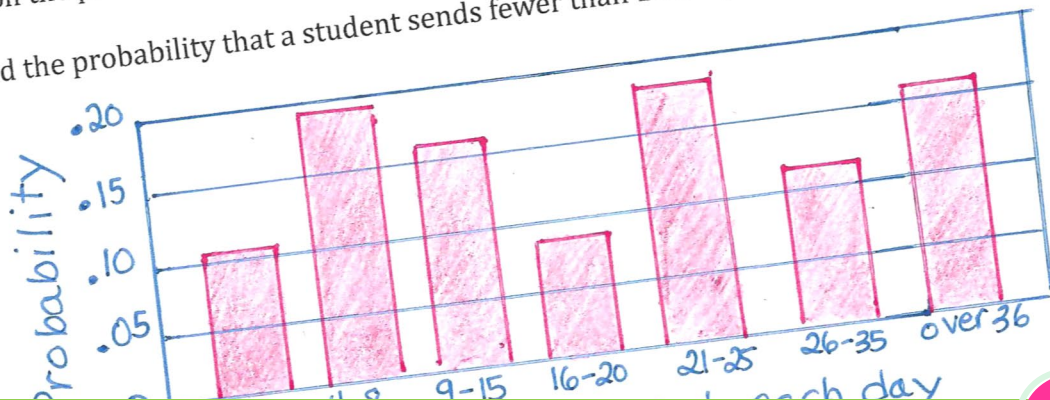


a poll, high school seniors were asked, "How many Snap Chats do you post every day"

Snap Chats	0 - 3	4 - 8	9 - 15	16 - 20	21 - 25	26 - 35	Over 36	Total
Number of Respondents	13	22	18	9	21	14	18	115
%	.11	.19	.16	.08	.18	.12	.16	1.00

A. Graph the probability distribution.

B. Find the probability that a student sends fewer than 16 Snap Chats each day.



Completely Editable

13.1

Lesson 13.I: Measures of Central Tendency

Term	Definition
Measures of Central Tendency	Mean, median, and mode are values that describe the center of a data set.
Mean	The sum of the values in a set divided by the number of values, usually seen as $\bar{x}$.
Median	When a set is ordered numerically, the middle value or the mean of the two middle values.
Mode	The value or values that occur most often. A data set may have no mode, one mode, or several modes.
Weighted average	Gives greater importance to some values in the set than to others.
Expected value	The weighted average of the possible outcomes for an experiment.
Box-and-Whisker Plot	Shows the spread of a data set for 5 key points: the minimum and maximum values, the median, and the first and third quartiles.
Quartiles	The medians of the lower and upper halves of the data set. If there are an odd number of data values, do not include the median in either half.
Interquartile Range	IQR is the difference between the 1 st and 3 rd quartiles, the middle 50% of the data.
Percentile	The value that divides the range of a data set into two parts, so that the part below the percentile contains a given percent of the data.
Outlier	A data value that is significantly different from the other items in the data set.

Finding Measures of Central Tendency

EX #1: Find the mean, median, and mode for these values:
97, 95, 98, 93, 89, 92, 95, 64, 88

EX #2: Find the mean, median, and mode for these values:
3.4, 4.1, 3.5, 3.7, 2.8, 5.2, 2.6

Real-World Application

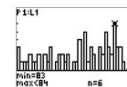
EX #3: The table below shows the water temperatures in the Southeastern Atlantic Ocean. Find the mean, median, and mode of all the water temperatures listed.

Location	J	F	M	A	M	J	J	A	S	O	N	D
Myrtle Beach, SC	48	50	55	64	73	78	82	83	80	70	61	53
Charleston, SC	50	50	57	66	73	79	83	84	81	71	63	54
Daytona Beach, FL	61	59	65	71	76	79	80	81	83	78	71	65
Savannah Beach, GA	51	52	59	67	74	80	85	85	82	73	64	54
St Augustine Beach, FL	57	56	61	69	75	80	83	83	83	75	67	60

STEP 4: Use the STAT PLOT feature to access Plot 1. Choose the histogram, L1, and frequency 1 options. Then enter an appropriate viewing window.



STEP 5: Graph the data. Use the TRACE feature to move the cursor to the highest points of the graph.



NOTE: On the screen, the mode appears as the minimum value for the cursor. The number of times the mode appears is $n = 6$.

EX #4: Find the mean, median, and mode for the water temperatures in Daytona Beach, Florida.

L1.

STEP 3: Return to the same menu to find the median.



STEP 2: Draw a number line for the base of the box-and-whisker plot. Plot the three quartiles, the minimum value, and the maximum value.

STEP 3: Finish the box-and-whisker plot by drawing a vertical line through the median, and line segments to the minimum and maximum values.

Using Technology: Box-and-Whisker Plot

EX #6: Pensacola, Florida is a Spring Break destination. The water temperatures are given below for January to December.

56	58	63	71	78	84	85	86
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STEP 1: Follow the procedure from EX #3 to find

Box-and-Whisker Plot

By arranging data in increasing order, the quartiles can be found. Use the median of each of the parts separating the four equal parts are the first, second, and third quartiles.

EX #5: Use the Daytona Beach, Florida water temperatures to draw a box-and-whisker plot.

STEP 1: Find the quartile values, the

59	61	65	65	71
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STEP 3: Use the TRACE feature to find the quartiles

$Q_1 =$ $Q_2 =$ $Q_3 =$

Using Percentiles and Outliers

A percentile is a value that divides the range of a data set into two parts such that the part below the percentile contains a given percent of the data. If a number x is at the 84th percentile in a data set, then about 84% of the data are less than x .

EX #7: Find the values at the 35th percentiles of the data below:

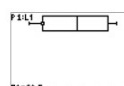
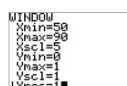
52	98	46	85	96	63	22	61	72	81
93	63	65	98	87	24	65	96	31	47

Order the values:

Find the number of values that fall below the 35th percentile:

Identify the 35th percentile:

NOTES



Name _____ Date _____

13.1

Measures of Central Tendency Practice

Problems 1 – 4, find the mean, median, and mode of each data set.

1. {4, 7, 5, 8, 4, 6, 4}

2. {2, 3, 3, 6, 6, 6, 8, 9}

3. {8, 10, 14, 16, 24, 26}

4. {3, 8, 8, 8, 9}

Problems 5 – 8, make a box-and-whisker plot of the data. Find the interquartile range.

5. {4, 5, 2, 2, 7, 8, 1, 12}

6. {3, 4, 1, 4, 3, 5, 8, 4}

7. {24, 25, 21, 28, 23}

8. {54, 51.5, 62, 58.5, 61, 63, 56, 55}

Problems 9 – 12, find the outlier for each set of values.

5. {2.4, 3.5, 2.6, 9.7, 1.3, 2.7, 1.0, 2.9}

6. {8, 9, 10, 12, 13, 15, 38, 17, 20}

7. {23, 16, 19, 12, 0, 15, 18, 21, 16}

8. {27, 15, 18, 18, 22, 1, 14, 18, 22}

Problems 13 – 14, find the values at the 30th and 90th percentiles for each set of values.

13. {124, 145, 238, 463, 351, 420, 167, 216, 385, 259}

14. {7, 16, 3, 5, 18, 20, 4, 2, 17, 4, 13, 2, 11, 8, 9, 15, 16, 8, 1, 7}

Problems 15 – 16, identify the outlier of each set of values. Then describe how its value affects the mean of the data.

15. {878, 762, 629, 590, 108, 924, 783, 595, 826, 1001, 674, 522}

16. {12, 48, 114, 88, 127, 106, 392, 213, 189, 147, 223}

Problems 17 – 21, complete each of the following

17. The data shown below represents the first heat for a Track and Field high jump event. Make a box-and-whisker plot for the data. {5.4, 5.8, 6.0, 5.9, 6.2, 6.4, 5.9, 5.8, 6.1, 6.6, 5.9, 5.6}

18. Find the 25th and 90th percentile for the scores from Mrs. Hogan's last quiz on probability. {12, 18, 16, 24, 20, 19, 16, 23, 25, 20, 19, 18, 18, 15, 17, 18, 22, 26, 22, 20}

19. In a recent election for school board members, a precinct with 18 voting locations reported the percentage of eligible voters who turned out to vote for each location. Make a box-and-whisker plot for the data. Find the interquartile range.

{53.8, 57.1, 55.2, 50.8, 49.2, 48.7, 50.6, 52.4, 44.8, 42.5, 51.1, 50.3, 47.8, 54.2, 53.4, 49.8, 47.3, 50.2 }

20. In a poll, high school seniors were asked, "How many Snap Chats do you post every day?"

Snap Chats	0 – 3	4 – 8	9 – 15	16 – 20	21 – 25	26 – 35	Over 36	Total
Number of Respondents	13	22	18	9	21	14	18	115

A. Graph the probability distribution.

B. Find the probability that a student sends fewer than 16 Snap Chats each day.

Practice Sets

Lesson Warm-Ups

18	36	45	15	36	34
50	25	36	22	42	45

2. Find the median of the data.

3. Find the mode and range of the data

Name _____ Date _____ Period _____

Lesson 13.1: Central Tendency Warm-Up #2

The number of minutes that your team members spend studying the coach/s playbook are shown below.

40	24	35	25	30	24
52	25	34	26	56	25

1. Find the mean of the data.

2. Find the median of the data.

3. Find the mode and range of the data

Form A

Period _____

19	21
25	20

13.1 Central Tendency Form B

Name _____

Date _____ Period _____

The cost per student in thousands of dollars from a sample of 10 universities is shown below.

143	215	178	182	164
223	281	138	167	206

1. Find the mean, median, mode of the data.

2. Explain which measure of central tendency best represents the data.

The temperatures in degrees at 7 a.m. for Orlando, Florida, in January, are shown below.

53	52	45	64	58	56
48	42	54	58	62	44

3. Make a box-and-whisker plot for the set of temperatures.

1. Find the mean, median, mode of the data.

2. Explain which measure of central tendency best represents the data.

The temperatures in degrees at 7 a.m. for Orlando, Florida, in January, are shown below.

23	23	19	19	28	14
12	11	25	28	21	23

3. Make a box-and-whisker plot for the set of temperatures.

Daily Lesson Quiz

Grade: _____

Grade: _____