

Algebra 2 Honors

Analyzing Data



: Find the variance and the standard deviation for the receipts from a month of grocery visits.

\$123.42, \$79.83, \$12.79, \$165.37, \$8.23, \$141.28, \$52.11

x	$x - \bar{x}$	$(x - \bar{x})^2$
\$123.42	40.13	1610.42
\$79.83	-3.46	11.97
\$12.79	-70.50	4970.25
\$165.37	82.08	6737.13
\$8.23	-75.06	5634.00
\$141.28	57.99	3362.84
\$52.11	-31.18	972.19

$$s = \sqrt{\frac{23,298.80}{7}} \approx \underline{\underline{\$57.69}} \quad s^2 = \underline{\underline{\$3328.40}} \text{ variance}$$

Completely Editable

13.2

Lesson 13.2: Analyzing Data

Term	Definition
Measures of Variation	Describe how the data in a data set are spread out (range, interquartile range, standard deviation).
Range	The difference between the greatest and least values.
Variance	The average of the squared differences from the mean (how the data is spread out from the mean).
Interquartile Range	IQR is the difference between the 1 st and 3 rd quartiles, the middle 50% of the data.
Standard Deviation	A measure of how each value in a data set varies, or deviates, from the mean. The Greek letter σ (sigma) represents standard deviation. - Find the mean of the data set: $\bar{x}$ - Find the difference between each value and the mean: $x - \bar{x}$ - Square each difference: $(x - \bar{x})^2$ - Find the average (mean) of these squares: $\frac{\sum (x - \bar{x})^2}{n}$ - Take the square root to find the standard deviation. $\sigma = \sqrt{\frac{\sum (x - \bar{x})^2}{n}}$

EX #2: There are nine members on the Historic Preservation Society. Find the range and interquartile range of their ages.

63, 64, 38, 47, 52, 53, 57, 61, 47

EX #3: The 2014 UCF Knights scored 24, 10, 41, 17, 31, 20, 34, 29, 31, 53, 16, 32, and 37 points in their 13 games.

A. Find the mean and the standard deviation of the data.

x	$x - \bar{x}$	$(x - \bar{x})^2$
24		
10		
41		
17		
31		
20		

B. Describe how the outlier affects the mean and the standard deviation.

EX #4: Find the mean and the standard deviation of the data for daily energy demand in a small town during July. One million watts of power delivered for one hour is one megawatt-hour (MWh).

Daily Energy Demands, in MWh, for July						
Sun	Mon	Tues	Wed	Thurs	Fri	Sat
	52	53	48	51	53	38
34	42	43	45	47	51	41
39	48	49	55	52	49	37

EX #6: Find the variance and the standard deviation for the receipts from a month of grocery visits.

\$123.42, \$79.83, \$12.79, \$165.37, \$8.23, \$141.28, \$52.11

x	$x - \bar{x}$	$(x - \bar{x})^2$
\$123.42		
\$79.83		
\$12.79		
\$165.37		
\$8.23		
\$141.28		
\$52.11		

Z-Scores

EX #7: Use the data from EX #4. Complete the following:

1 standard deviation above mean $\bar{x} + \sigma$	
1 standard deviation below mean $\bar{x} - \sigma$	

Standard Deviation and Outliers

EX #5: A medical research lab is growing a virus culture in the lab. For a certain strain of the virus, these doubling times were recorded: 46 min, 37 min, 42 min, 38 min, 89 min, 41 min, 39 min, 43 min, 37 min, 41 min, and 40 min.

A. Find the mean of the data.

B. Find the standard deviation.

C. Identify any outliers.

D. Describe how any outlier affects the mean and the standard deviation.

B. In August, the mean daily energy requirements is 39.4 MWh, with a standard deviation of 3.2 MWh. The power company makes plans for any demand within three standard deviations of the mean. Will they be prepared for a demand of 51 MWh? Explain.

C. Find the z-score of 61 MWh with standard deviation of 3.2 and mean of 39.4.

NOTES

Name _____ Date _____

13.2

Analyzing Data Practice

Problems 1 – 4, find the range and the interquartile range of each set of values.

1. 6 7 8 4 5 6 7 8 9

2. 42 65 120 33 76 94 18

3. 56 41 32 38 45 58
37 29 34 53 41 36

4. 302 456 194 583 436
518 237 205 541 387

Problems 5 – 8, the mean and the standard deviation for each set of values.

5. 74 92 345 572 112 367 24

6. 26 19 25 15 13 17 10 12

7. 157 185 236 171 234 169 227 184 206

8. 1.04, 2.32, 1.85, 0.94, 1.63, 0.77, 1.16, 1.08

Problems 9 – 12, a data set has mean 30 and standard deviation 5. Find the z -score of each value.

9. 42

10. 16

11. 124

12. 30

Problems 13 – 14, find the standard deviation for each data set. Use the standard deviations to compare each pair of data sets.

13. Men's golf scores in a local tournament: 68 74 76 69 71 72 72 68 70 78

Women's golf scores in a local tournament: 77, 82, 94, 76, 80, 83, 84, 81, 79, 87

14. Weekly mileage driven: 18, 124, 62, 23, 217, 51, 29, 38

Weekly lunch costs: \$43, \$51, \$36, \$38, \$26, \$41, \$49, \$32

Problems 15 – 18, find the variance and standard deviation of each data set.

15. 6 min, 9 min, 8 min, 5 min, 11 min, 9 min

16. 0.4 g 0.92 g, 0.6 g, 0.72 g, 0.64 g

17. \$4.97, \$5.52, \$7.31, \$9.84, \$8.96

18. 6 ft, 5.4 ft, 8.25 ft, 6.3 ft, 4.8 ft, 5.8 ft

Problems 19 – 22, determine the number of standard deviations that includes all data values.

19. The mean score on a standardized test is 230; the standard deviation is 54.
167 107 254 209 287 346 232 387 304 193

20. The mean age of students in a high school is 16.3 years; the standard deviation is 1.5.
15 18 17 15 16 14 16 18 17 16 14 15 15 16 18 17 17

21. The average rainfall for the month of May for several southern cities is as follows:
2.8 2.0 3.2 5.3 4.7 3.3 2.8 2.6 1.8 3.2 4.1 4.2 2.9 3.7 3.2 2.7

A. Find the mean of the data.

B. Find the standard deviation of the data.

C. Find the range of the data.

D. Within how many standard deviations is a rainfall of 2.6 in? 4.2 in?

22. The test scores for Mr. Goodson's algebra test are as follows:
68 71 73 74 74 75 76 78 78 78 83 85 85 85 85

Practice Sets

E. Find the standard deviation.

E. Within how many standard deviations of the mean is a score of 717, 85?

Lesson Warm-Ups

	53	52	54	46	45	41	49
2. Find the mean and median of the data.	3. Find the mode and range of the data						

Name _____ Date _____ Period _____															
Lesson 13.2: Analyzing Data Warm-Up #2															
1. Find the outliers of each set of values. 31 34 3 35 36 34 37 39 41 33	Use the data set below for questions #2 - 3: <table border="1"><tr><td>50</td><td>41</td><td>49</td><td>35</td><td>31</td><td>5</td><td>3</td></tr><tr><td>53</td><td>52</td><td>54</td><td>68</td><td>82</td><td>41</td><td>62</td></tr></table>	50	41	49	35	31	5	3	53	52	54	68	82	41	62
50	41	49	35	31	5	3									
53	52	54	68	82	41	62									
2. Find the mean and median of the data.	3. Find the mode and range of the data														

Form A

Period _____

ed by a large
thousands of

below.

13.2 Analyzing Data	Form B	
Name _____		
Date _____ Period _____		
At a job fair 10 graduates were hired by a large company. The starting salaries, in thousands of dollars, is shown below.		
1. Complete the table for the data below.		
Salary x	Deviation $x - \bar{x}$	Squares $(x - \bar{x})^2$
29		
40		
41		
50		
52		
34		
49		
58		
32		
46		
2. Find the mean of the data.		
3. Find the population standard deviation.		
$\sigma = \sqrt{\frac{\sum (x - \bar{x})^2}{n}}$		

Salary x	Deviation $x - \bar{x}$	Squares $(x - \bar{x})^2$
42		
38		
36		
45		
48		
41		
43		
41		
39		
41		

2. Find the mean of the data.

3. Find the population standard deviation.

$$\sigma = \sqrt{\frac{\sum (x - \bar{x})^2}{n}}$$

Daily Lesson Quiz

Grade:

Grade: