



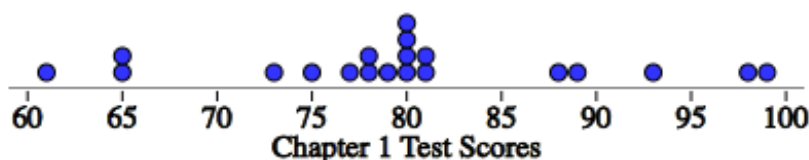
Lesson 2.1: How Did I Do?



How well did you do on the Chapter 1 Test? How well did you do relative to your classmates?

Here are the results of a random sample of 20 of the Chapter 1 Tests, along with a dotplot and summary statistics.

Test Scores	61	65	65	73	75	77	78	78	79	80	80	80	80	81	81	88	89	93	98	99
-------------	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----



n	mean	SD	min	Q1	med	Q3	max
20	80	10	61	76	80	84.5	99

1. Biff scored a 65. What is Biff's percentile?
2. Was Biff above or below the mean? By how many points? By how many standard deviations?
3. Marty scored an 88. What is Marty's percentile?
4. Was Marty above or below the mean? By how many points? By how many standard deviations?

A z-score is defined as the number of standard deviations above or below the mean.

5. Write a formula for calculating a z-score. $z =$
6. Goldie scored a 98 on the Chapter 1 Test. Find and interpret the z-score.

Bonus: Goldie was aspiring for what job?

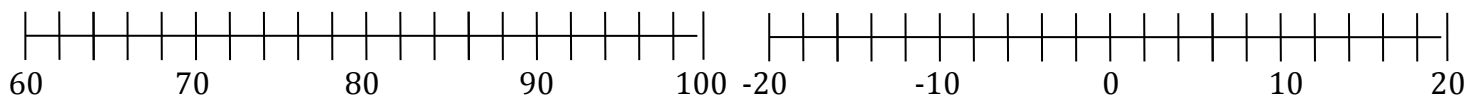
There are two mathematical operations involved in calculating a z-score: $z = \frac{VALUE - MEAN}{SD}$

1. First, we take each score, and _____ the mean (remember the mean was 80). Fill in the table and then make a dotplot for each.

SCORE	61	65	65	73	75	77	78	78	79	80	80	80	80	81	81	88	89	93	98	99
SCORE - MEAN																				

Dotplot for SCORE

Dotplot for SCORE - MEAN

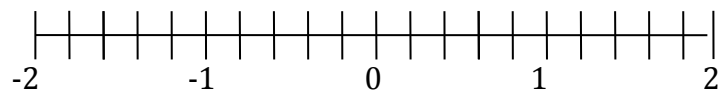


What happens to the shape, center, and variability when you subtract the mean from each score?

2. Second, we take the SCORE - MEAN and _____ by the standard deviation (remember the standard deviation is 10). Fill in the table and then make a dotplot for each.

SCORE - MEAN	-19	-15	-15	-7	-5	-3	-2	-2	-1	0	0	0	0	1	1	8	9	13	18	19
SCORE - MEAN																				
SD																				

Dotplot for $\frac{SCORE - MEAN}{SD}$



What happens to the shape, center, and variability when you divide by the standard deviation for each value?

Let's summarize:

If you are given a list of data and you **add or subtract the same value a** from each value:

Shape _____ Center _____ Variability: _____

If you are given a list of data and you **multiply or divide by the same value b** from each value:

Shape _____ Center _____ Variability: _____

The Chapter 1 Test scores have a mean of _____ and a standard deviation of _____.

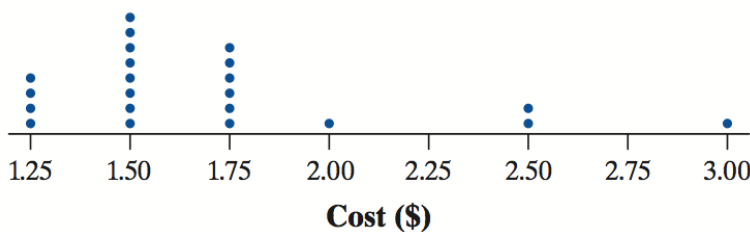
The z-scores of the Test scores have a mean of _____ and a standard deviation of _____.

Lesson 2.1 – Describing Location in a Distribution

Big Ideas:

Check Your Understanding:

Knoebels Amusement Park in Elysburg, Pennsylvania, has earned acclaim for being an affordable, family-friendly entertainment venue. Knoebels does not charge for general admission or parking, but it does charge customers for each ride they take. How much do the rides cost at Knoebels? The figure shows a dot-plot of the cost for each of 22 rides in a recent year, along with summary statistics.



<i>n</i>	Mean	SD	Min	Q_1	Median	Q_3	Max
22	1.705	0.447	1.25	1.5	1.5	1.75	3

1. Suppose you convert the cost of the rides from dollars to cents (\$1=100 cents). Describe the shape, mean, and standard deviation of the distribution of ride cost in cents.
2. Knoebels' managers decide to increase the cost of each ride by 25 cents. How would this the shape, center, and variability of this distribution compare with the distribution of cost in Question 1?
3. Now suppose you convert the increased costs from Question 2 to z-scores. What would be the shape, mean, and standard deviation of this distribution? Explain your answers.

Homework: Pg 106 -- 15, 19, 21, 25, 29, 33–38