

February 7, 2020

1) CALC

2) Notes - Start

Warm Up

<u>Height</u>			
67	65	71	67
67	75	82	
63	62	62	
66	65	62	
71	67	63	
60	67	64	
67	64	64	
63	63	65	
65	68	62	

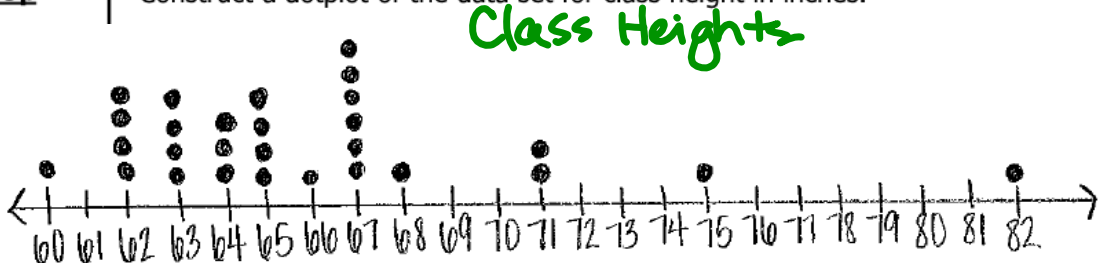
Topic: Percentiles and Z-Scores

Name: _____

What am I learning today?

Warm Up

Construct a dotplot of the data set for class height in inches.



Using a calculator, find the mean and standard deviation for the distribution of the class' height.

$$\bar{x} = 65.96 \quad S_x = 4.51$$

**Main Ideas/
Questions**
Percentile

Notes

The **percentile** of a data value tells us what percent of the observations fall less than or equal to it.

The lowest score is in the 1st percentile. There is not a 0th percentile.

The highest score is in the 99th percentile. There is not a 100th percentile.

Examples

$$\frac{\# \text{ of values}}{\text{TOTAL}}$$

Calculate the percentile for the following heights using the dotplot above.

1) 67 inches

$$\frac{23}{28} = .82 \quad \underline{82^{\text{nd}} \text{ Percentile}}$$

2) 62 inches

$$\frac{5}{28} = .18 = 18^{\text{th}} \text{ Percentile}$$

3) 82 inches

$$\frac{28}{28} = 1.00 \rightarrow 99^{\text{th}} \text{ Percentile}$$

4) 60 inches

$$\frac{1}{28} = .04 \quad 4^{\text{th}} \text{ Percentile}$$

Explain in words what it means to be in the....

1) 60th percentile for a height of 66 inches

60% of the people are 66in or shorter. (or less).

2) 25th percentile for test score of 30%.

25% of test-takers scored a 30% or less (or worse)

Topic: Percentiles and Z-Scores

Date: _____

**Main Ideas/
Questions**

Z-Score

Notes

Recall: Standard deviation is a measure of spread. It shows on average how far the data is from the mean.

A z-score shows how many standard deviations a data point is from the mean.

~~A z-score is sometimes called a _____ value.~~

A positive z-score is above the mean, and a negative z-score is below the mean.

A z-score is typically between -3 and 3.

Formula

$$z = \frac{x - \bar{x}}{S_x}$$

Calculate the z-score for the following heights using the mean and standard deviation above.

1) 67 inches

$$z = \frac{67 - 65.96}{4.51}$$

3) 82 inches

$$z = \frac{82 - 65.96}{4.51} = 3.56$$

2) 62 inches

$$z = \frac{62 - 65.96}{4.51}$$

$$z = -0.88$$

Explain in words what it means to have a z-score of...

1) Z=2.5 for a height of 75 inches 75in. is 2.5 st.dev. ABOVE the mean.

1) Ava scores an 85 on her biology test. The distribution of biology scores have a mean of 82 and a standard deviation of 2. Ava takes a physical science test and scores a 90 with a class mean of 96 and standard deviation of 3. Which test did she perform better in comparison to her classmates? Explain.

Biology:

$$z = \frac{85 - 82}{2}$$

$$z = 1.50$$

Physical science:

$$z = \frac{90 - 96}{3}$$

$$z = -2.00$$

Ava did better on Biology b/c her z-score is higher.

\bar{x} = Mean
 S_x = St. Dev.
 x = Data Value
Examples

Z-score
 ⊕ ALWAYS
 Round to
 2 decim.
 places