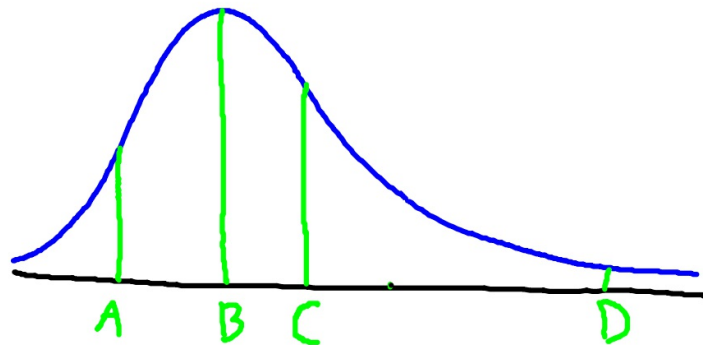


# Warm Up



What points are the mean and median closest to?



Fri. Sept. 16

Objective: SWBAT locate data points in a set using z-scores and cumulative frequency charts.

Agenda:

- Warm Up
- Notes
- Practice
- Reflection

## Notes: percentiles

The  $p$  percentile of a distribution is the value greater than  $p\%$  of the observations.

For example, the median is the 50th percentile.

to find the percentile of a data point:

$$p = \frac{(\# \text{ of values less than the point})}{(\# \text{ of values in the set of observations})}$$

examples: pg. 85

## Notes: Cumulative Relative Frequency Graphs

Also known as "ogives," these can be useful if you want a graph that lets you find the percentile of a given value.

Before you can make an ogive, the absolute frequencies must be known.

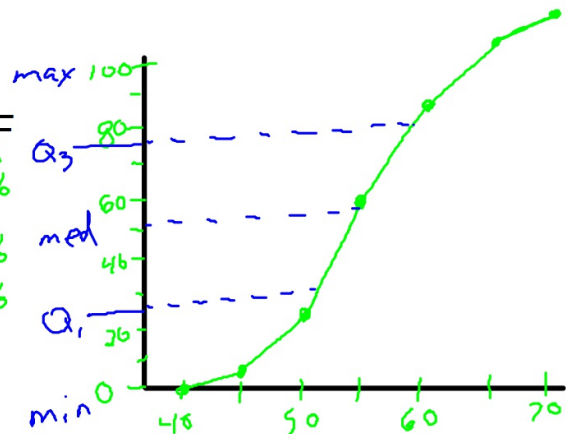
*(or relative)*

## Making ogives

1. Find the cumulative frequency by adding up the absolute frequencies
2. Divide each by the total to get the cumulative relative frequencies
3. Graph (Excel/Google: calculate first, then do it as a line graph)

ex) pg. 86

Age	Frequency	C.F	C.R.F
40-44	2	2	4.5%
45-49	7	9	20.5%
50-54	13	22	50%
55-59	12	34	77.2%
60-64	7	41	93.2%
65-69	3	44	100%



## Z-Scores

Z-scores are a way to compare individuals to an average, or compare individuals from one sample to those in another.

Converting to z-scores is called *standardizing* and is done like this:

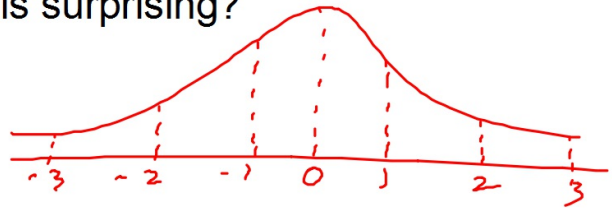
$$z = \frac{x - \text{mean}}{\text{standard deviation}}$$

z can be positive or negative, and measures how far above or below a number is from the mean, in units of standard deviations.

## Example

1. Calculate z for a test score of 80 if the mean was 76 and the standard deviation was 4. Is this surprising?

$$z = \frac{80 - 76}{4} = 1$$



2. Compare #1 to a test score of 75 if the mean was 70 and the standard deviation was 3. Who did better, relatively speaking?

$$z = \frac{75 - 70}{3} = \frac{5}{3} = 1.67$$

## Practice

Work on the practice problems.

## Reflection

What is an advantage of the cumulative relative frequency graph (ogive)?