Algebra 1 0.12

Find measures of central tendency, variation, and position

variable changes

data information

measurement

→ qualitative (categorical)

→ quantitative (numerical)

univariate Measure 1 thing

central tendency

- mean = $\frac{\text{Sum}}{n} = \mu$
- median = middle
- mode = most common (2 way tie ok)

variation

- range
- quartile
- IQR
- outlier
- 5-number summary

Activity: grab cubes

KeyConcept Measures of Center

- The **mean** is the sum of the values in a data set divided by the total number of values in the set.
- The **median** is the middle value or the mean of the two middle values in a set of data when the data are arranged in numerical order.
- The **mode** is the value or values that appear most often in a set of data. A set of data can have no mode, one mode, or more than one mode.

Skol Vikings!

Example 1 Measures of Center

BASEBALL The table shows the number of hits Marcus made for his team. Find the mean, median, and mode.

Team Played	Hits
Badgers	3
Hornets	6
Bulldogs	5
Vikings	2
Rangers	3
Panthers	7

$\left(\frac{26}{6}\right) = 4.3$ mean

~~2~~ ~~3~~ 3 5 ~~6~~ ~~7~~ 4 med

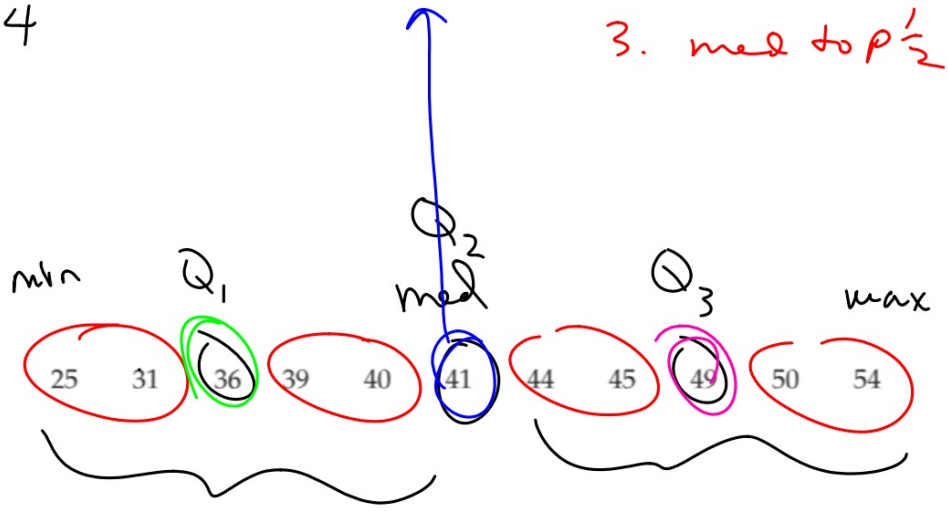
3 mode

Quartiles:

4

1. median 2. med bottom $\frac{1}{2}$

3. med top $\frac{1}{2}$



min 14
Q_1 17
med 21
Q_3 28
max 35

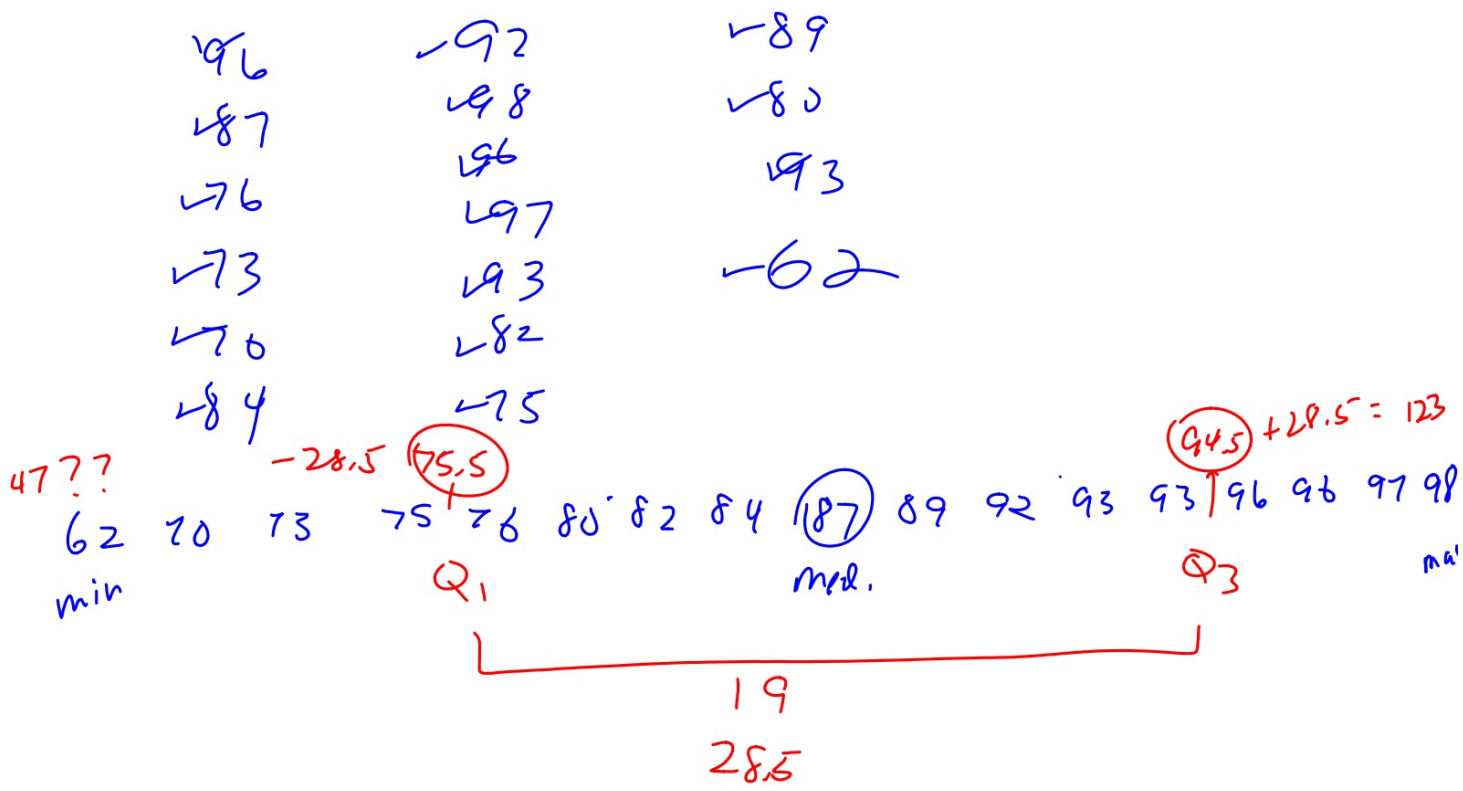
$\frac{1}{2}$ are less than 21
$\frac{1}{2}$ are greater than 21

Example 3 Five-Number Summary

FUNDRAISER The number of boxes of donuts Aang sold for a fundraiser each day for the last 11 days were 22, 16, 35, 26, 14, 17, 28, 29, 21, 17, and 20. Find the minimum, lower quartile, median, upper quartile, and maximum of the data set. Then interpret this five-number summary.

14 16 17 17 20 21 22 26 28 29 35

14 min. Q_1 = 17 Q_2 = 21 med Q_3 = 28 max


96 92 89
87 98 80
76 96 93
73 97
70 93 62
84 82
75
47??
-28.5
75.5
94.5
+28.5 = 123
62 70 73 75 76 80 82 84 87 89 92 93 93 96 96 97 98
min
Q1
med.
Q3
19
28.5

IQR – interquartile range $Q_3 - Q_1$

Outlier doesn't fit in

Example 4 Effect of Outliers

TEST SCORES Students taking a make-up test received the following scores: 88, 79, 94, 90, 45, 71, 82, and 88.

a. Identify any outliers in the data.

b. Find the mean and median of the data set with and without the outlier. Describe what happens.

Data Set	
with outlier	
without outlier	