

2.9 Measures of Spread

Warm up:

Find the median and mean for each set of Data:

Data set 1

15, 9, 13, 10, 11

9, 10, 11, 13, 15

Mean: 11.6

Median: 11

Data set 2

27, 38, 15, 22, 29, 32

15, 22, 27, 29, 32, 38

Mean: 27.2

Median: $\frac{27+29}{2} = 28$

Mar 21-12:03 PM

Quartiles and Box-and-Whisker Plots

The data shows the number of pizzas sold at a local restaurant for the last 12 days.

8 10 14 26 17 19 4 2 34 22 20 21

Order the data from least to greatest:

2, 4, 8, 10, 14, 17, 19, 20, 21, 22, 26, 34

Determine the median. $\frac{17+19}{2} = 18$

Determine the median of the bottom half of the data. This is Q1...the first quartile.
 $Q_1 = 9$

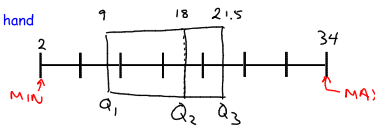
Determine the median of the top half of the data. This is Q3...the third quartile.
 $Q_3 = 21.5$

The Interquartile Range (IQR) is the difference between Q3 and Q1.
 (measures how closely the data clusters around the median).

Display the data in a box-and-whisker plot using an appropriate scale:

a) using technology:

b) By hand



- How to...**
- First you will need to draw an **ordinary number line** that extends far enough in both directions to include all the numbers in your data.
 - locate the **median** using a vertical line just above your number line
 - do the same for Q₁ and Q₃
 - Next, draw a box using the lower and upper median lines as endpoints
 - Finally, the **whiskers** extend out to the data's smallest number and largest number

Mar 3-11:09 AM

Range, Variance and Standard Deviation

Range: the difference between the greatest and least values of data

Largest - Smallest

Variance: the average of the squares of the distance between a data value and the mean of the data

Standard Deviation = $\sqrt{\text{variance}}$

the bigger the sd the more spread out the data is

Mar 3-11:25 AM

Ex. Jordan's weekly food expenses are listed below.
Calculate the range, mean, variance and standard deviation.

60 75 72 86 95 55 80 87 65 62

range: $95 - 55 = 40$ mean: 73.7

variance:

expenses \$\$	data - mean	(data-mean) ²
55	$55 - 73.7 = -18.7$	$(-18.7)^2 = 349.69$
60	-13.7	187.69
62	-11.7	136.89
65	-8.7	75.69
72	-1.7	2.89
75	1.3	1.69
80	6.3	39.69
86	12.3	151.29
87	13.3	176.89
95	21.3	453.69

total: 1576.03

variance = total ÷ # data

$= \frac{1576.03}{10}$
 $= 157.6$

std. dev.

$= \sqrt{\text{variance}}$
 $= 12.5$

Standard Deviation = $\sqrt{\text{variance}}$

Mar 3-12:14 PM

Practice:

page 145 #1,2ab,5a,6a,7ab,8,9,13

Finding Std. Dev.

- ① Find the mean of your data
- ② Layout a table
 - 3 columns: - Data Points
 - Data Point - Mean ←
 - Square previous column
- ③ Add up all the values in last column
- ④ Divide by number of data points
↑ VARIANCE ↑
- ⑤ Take square root of the variance
This is STANDARD DEVIATION

Mar 3-12:43 PM