

DATA ANALYSIS (DAY 1) NOTES

VOCABULARY

Stem-and-leaf plot arrangement of digits that is used to display & order numerical data

Measures of Central Tendency a # used to represent typical # in ^{data} set

Mean (average) sum of # \div amount of numbers

Mode the # or #'s that occur the most

Median middle # when data is organized from ^{least to} greatest

Range max. data value - min. data value

Outlier: are values that "lie outside" the other values.

Use a graphing calculator to find the mean, median, mode, and range.

Step 1	Insert data: <ul style="list-style-type: none"> Enter the data into the STAT..."1: Edit..."L1. Press ENTER after each data point is entered.
Step 2	Calculate data: <ul style="list-style-type: none"> Press STAT...scroll to the right once to CALC...press ENTER on "1: 1-Var Stats" Select list 1 by pressing 2ND 1...press ENTER
Step 3	How to interpret the results on your home screen: <ul style="list-style-type: none"> \bar{x} = represents the mean (average of data) \rightarrow use this value when asked for the mean n = represents the number of data points $minX$ = represents the minimum data value Med = represents the median value of the data \rightarrow use this value when asked for the median $maxX$ = represents the maximum data value When asked for the range, subtract the "minX" from "maxX".
Step 4	How to find the mode: <ul style="list-style-type: none"> Press STAT...press "2: Sort A" (ascending order) Select list 1 by pressing 2ND 1...press ENTER (you have now organized your data in order from least to greatest) Press STAT...select "1: Edit..." To find the mode, scroll up and down to see which data value(s) appear the most.

EXAMPLES ~ Make a Stem-and-Leaf Plot. Then find mean, median, mode, and range.

1. The bakery collected the following data about the number loaves of fresh bread sold on each of 24 business days:

53	49	27	48	60	52	27
44	38	47	52	82	46	24
35	31	39	54	51	47	20
40	45	50	61	43	68	11

a. Make a stem-and-leaf plot of each data.

Stem	Leaf
2	7
3	1, 8, 9
4	3, 4, 5, 6, 7, 7, 8, 9
5	0, 0, 1, 2, 2, 3, 4, 5
6	0, 1, 4
7	
8	2

b. Find the median and mode(s) of the data.

$$\text{med.} = \frac{49 + 50}{2} = 49.5$$

mode: 47, 50, 52 occur twice

c. Find the average of the data.

$$\text{mean: } \frac{\text{Sum}}{24} = \frac{1188}{24} = 49.5$$

KEY:
2|7 = 27 loaves

2. The data shows the ages of 24 patients who were treated in one day at a health clinic:

25	12	30	20	15	16	12	19
13	18	27	43	23	19	15	11
22	20	67	53	19	25	12	18
66	35	11	20	37	41	16	19

a. Make a stem-and-leaf plot of each data.

Stem	Leaf
1	1, 2, 3, 5, 6, 8, 9, 9
2	0, 0, 0, 2, 3, 5, 5, 7
3	0, 5, 7
4	1, 3
5	3
6	6, 7

b. Find the median and mode(s) of the data.

$$\text{med: } \frac{22 + 23}{2} = 22.5$$

mode: 20 occurs three times

c. Find the average of the data.

$$\text{mean: } \frac{\text{Sum}}{24} = \frac{667}{24} = 28.21$$

KEY:
1|2 = 12 years old

EXAMPLES ~ Find the value of "x" such that the data set has the given mean.

3. 55, 60, 35, 90, x; mean 51

4. 6.5, 4.3, 9.8, 2.2, x; mean 4.8

5. 100, 112, 98, 235, x; mean 127

5. $\frac{55+60+35+90+x}{5} = 51 \cdot 5$ $\frac{6.5+4.3+9.8+2.2+x}{5} = 4.8 \cdot 5$ $\frac{100+112+98+235+x}{5} = 127 \cdot 5$

$240+x = 255$ $22.8+x = 24$ $545+x = 635$

$x = 15$ $x = 1.2$ $x = 90$

EXAMPLES ~ Word Problems

6. The points scored by a football team are show in the stem-and-left plot below.

Football Team Points

0	6							
1	2	3	4	7				
2	0	3	4*	4	7	8	8	8
3	0	7	8					

What was the median number of points scored by the football team?

med. = $\frac{24+24}{2} = 24$ points

Key	
1 3	= 13 points

7. The weight, in pounds, of each wrestler on the high school wrestling team at the beginning of the season is 178 142 112 150 206 130

112, 130, 142, *150, 178, 206

A. What is the median weight of the wrestlers?

$\frac{142+150}{2}$

Median: 146 pounds

B. What is the mean weight of the wrestlers?

$\frac{918}{6}$

Mean: 153 pounds

Two more wrestlers join the team during the season. The addition of these wrestlers has no effect on the mean weight of the wrestlers, but the median weight of the wrestlers increases 3 pounds. med. now 149

$8 \cdot \frac{918+2x}{8} = 153 \cdot 8$

$918+2x = 1224$

$2x = 306$

$x = 153$



A. Determine the weights of the two new wrestlers.

new wrestlers: 148 pounds and 158 pounds

median of new wrestlers weights

8. The lengths of Ana's last six phone calls were 3 min, 19 min, 2 min, 44 min, 120 min, and 4 min. Greg's last six phone calls were 5 min, 12 min, 4 min, 80 min, 76 min, and 15 min. Find the mean, median, mode, and range of Ana's calls and Greg's calls. Use your results to compare each person's phone call habits.

Ana's phone calls

2, 3, 4, 19, 44, 120

mean: $\frac{192}{6} = 32$ min. range: 120 min - 2 min = 118 min.

med.: $\frac{4+19}{2} = 11.5$ min

mode: none

Greg's phone calls

4, 5, 12, 15, 76, 80

mean: $\frac{192}{6} = 32$ min.

med.: $\frac{12+15}{2} = 13.5$ min.

mode: none

range: 80 min - 4 min = 76 min.

9. You and a friend weigh your loaded backpack every day for a week. The results are shown in the table. Find the mean, median, mode, and range of the weights of your backpack and your friend's backpack. Use your results to compare the backpack weights.

Day	Weight (lbs)	
	Yours	Friend
Monday	13.5	12.6
Tuesday	12.2	13
Wednesday	13.2	12.8
Thursday	11.6	11.6
Friday	10.5	12.5

You
 Mean: 12.2 lbs
 Median: 12.2 lbs
 Mode: None
 Range: 3 lbs

Friend
 Mean: 12.5 lbs
 Median: 12.6 lbs
 Mode: None
 Range: 1.4 lbs

Yours: 10.5, 11.6, 12.2, 13.2, 13.5

Friend: 11.6, 12.5, 12.6, 12.8, 13

The average weight of your backpack is 12.2 lbs, while your friend's is 12.5 lbs.
 [Additional answers are possible]

10. BIRTHDAYS Use a stem-and-leaf plot (months as stems, days as leaves) to write the birthdays in order from earliest in the year to latest (1 = January, 2 = February, and so on). Include a key with your stem-and-leaf plot.



stem	leaf
1	3, 24, 25
2	3, 20, 22
3	17
4	1, 8, 14, 17, 30, 30
5	10
6	3, 5, 13, 24
7	31
8	21, 26
9	12
10	11, 17
11	4, 11, 28
12	9, 15, 28

KEY: 10|11 = 10-11 [October 11th]

#8 continued:

- Ana & Greg spend the same ave. of time on the phone.
- Ana's phone calls range from 2 min. to 120 min., while Greg's phone calls range from 4 min. to 80 min.
- [Additional answers are possible]

Does the outlier affect the average phone calls?
 Ana's longest phone call was 120 min. This outlier affects the mean.
 Greg's longest phone calls were 76 min. & 80 min. These outliers affect the mean.