Measures of Central Tendency Practice | MEL4E

1) Find the mean, median and mode for the following. You must show your work.

12 ~~23~~ 25 24 ~~22~~ ~~18~~ ~~23~~ ~~23~~ ~~19~~

12 18 19 22 (23) 23 23 24 25

$$\text{mean} = \frac{\text{Total}}{9} = \frac{189}{9} = 21$$

median = 23

mode = 23 (3 times)

2) Find the mean, median and mode for the following. You must show your work.

~~$2300~~ ~~$2350~~ ~~$2340~~ ~~$2350~~ ~~$2360~~ ~~$2350~~ ~~$2336~~ ~~$2330~~

2300 2330 2336 (2340 2350) 2350 2350 2360

$$\text{mean} = \frac{\text{Total}}{8} = \frac{18,716}{8} = \$2,339.50$$

$$\text{median} = \frac{2340 + 2350}{2} = \$2,345$$

mode = $2,350 (3 times)

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3) Kendall, Cale, and Dave work at Double Deal Pizza. Their manager needs to save some money and is going to fire two of them.

The following data represents the number of pizzas each made in one hour over the course of 9 hours (spread over different shifts. Calculate the mean, median, and mode for each employee, and make a case to keep each one!

Kendal:	12	14	16	17	18	20	25	33	40

Mean = $\frac{195}{9} \div 21.7$ Median = 18 Mode = N/A

Cale:	5	7	8	9	10	25	25	25	25

Mean = $\frac{139}{9} \div 15.4$ Median = 10 Mode = 25

Dave:	10	12	15	21	21	22	23	24	25

Mean = $\frac{173}{9} \div 19.2$ Median = 21 Mode = 21

Why keep Dave?

Why would you keep Kendal?

Why would you keep Cale?

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It is often convenient to use a central value to summarize a set of data. Howerver, there are several different ways to find values around which a set of data tends to cluster. You have likely been introduced to 3 of them already...

Mean: The mean is defined as the total of all the values of a variable, divided by the number of values.

$$\text{Mean} = \frac{\text{Total of the Values}}{\#\text{ of Values}}$$

Median: The median is the central value of the data **after they are ranked.** In the case of two central values, the median is the average of these two values.

Example: Find the mean and median for these data sets...

2 middle #s

Data Set	a) {1, 4, 5, 8, 9, 11, 14, 18, 20}	b) {2, 2, 4, 7, 10, 11, 12, 13}
Sort the Data	N/A	N/A
~~Median~~ Mean	$\frac{\text{Total}}{9} = \frac{90}{9} = 10$	$\frac{\text{Total}}{8} = \frac{61}{8} = 7.625$
Median	Median = 9	Median = $\frac{7+10}{2} = 8.5$
Data Set	c) {2, 5, 4, 7, 8, 4, 6, 3}	d) {3, 4, 2, 5, 11, 6, 5, 5, 4}
Sort the Data	2, 3, 4, 4, 5, 6, 7, 8	2, 3, 4, 4, 5, 5, 5, 6, 11
~~Median~~ Mean	$\frac{\text{Total}}{8} = \frac{39}{8} = 4.875$	$\frac{\text{Total}}{9} = \frac{45}{9} = 5$
Median	Median = $\frac{4+5}{2} = 4.5$	Median = 5

Mode: The mode is the most frequently occuring data value (or values), if there is one. A set of data can have one mode if one value stands out. A set of data can have several modes if multiple values standout. A set of data can also have no mode, if there is a tie between all of the numbers.

a) {1, 2, 3, 4, 4, 5}

mode = 4

b) {1, 2, 3, 3, 4, 4, 5}

modes = 3 and 4

c) {1, 2, 3, 4, 5, 6}

No mode

d) {1, 1, 2, 2, 3, 3}

No mode

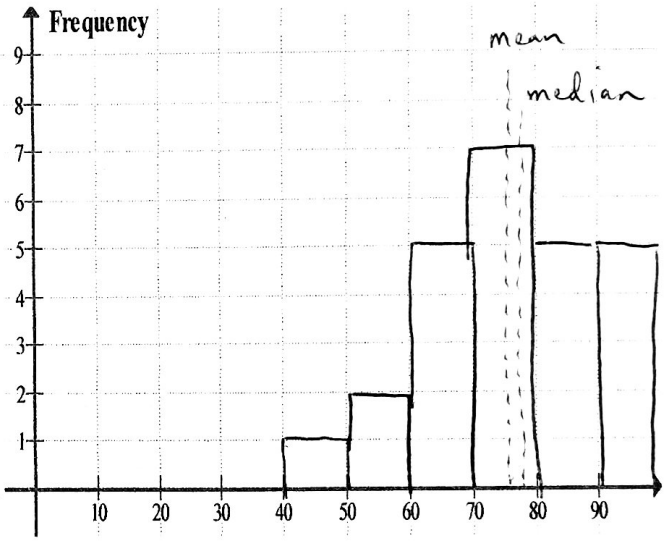
Displaying One-Variable Data

One way to display one-variable data is with a *histogram*. Let's make a histogram for the following final grades for a group of 25 university students:

~~66~~	~~88~~	~~75~~	92	~~78~~
~~44~~	~~55~~	~~79~~	~~81~~	95
~~67~~	~~76~~	94	~~83~~	99
91	~~88~~	~~78~~	~~65~~	~~56~~
~~65~~	~~70~~	~~80~~	~~62~~	~~73~~

Group the data into interval widths of 10, and create a histogram for this set of data. Use a ruler! You can use the tally column to help you with the counting.

Interval	Tally	Frequency
40 - 49		1
50 - 59		2
60 - 69		5
70 - 79		7
80 - 89		5
90 - 100		5
Totals		25



Calculate the mean, median and mode for this set of data. You will need to sort the data first. Add a bold vertical line on your graph for the mean and median only.

Sorted Data:

~~44~~, ~~55~~, ~~56~~, ~~62~~, ~~65~~, ~~65~~, ~~66~~, ~~67~~, ~~70~~, ~~73~~, ~~75~~, ~~76~~, 78, 78, 79, 80, 81, 83, 88, 88, 91, 92, 94, ~~95~~, ~~99~~

$$\text{mean} = \frac{\text{Total}}{25} = \frac{1900}{25} = 76$$

median = 78

modes = 65 and 78 and 88 (each happen twice)