

AVERAGES (MEAN, MEDIAN, AND MODE) INSTRUCTION SHEET

A. Finding the Mean

The mean of a set of values is the sum of the values divided by the number of values. It is also called the average.

Example: Find the mean of 19, 13, 15, 25, and 18

$$\frac{19 + 13 + 15 + 25 + 18}{5} = \frac{90}{5} = 18$$

When the mean is known and you must find a missing value, some simple rules of algebra must be applied.

Example: Cory has received the following grades this term: 75, 87, 90, 88, 79. If he wishes to earn an 85 average, what must he score on his final test?

Set up the problem like this: $\frac{75 + 87 + 90 + 88 + 79 + s}{6} = 85$

To solve:

1. Add the known values.

$$\frac{419 + s}{6} = 85$$

2. Next, we want to try to isolate the unknown (s) on one side of the equation. To do this we must use inverse operations to eliminate the numbers on the side of the equation with the unknown (this means we do the opposite of what is being done).

Start with the 6. Since we are dividing the expression $419 + s$ by the 6, we must now multiply it by 6. **NOTE:** Whatever you do to one side of the equation, you must do to the other side of the equation as well. Therefore, I will multiply the 85 by 6 too.

$$6 \times \frac{419 + s}{6} = 85 \times 6$$

I can cancel the 6s on the left side of the equation. This leaves you with the equation:

$$419 + s = 510$$

Now we must eliminate the 419 from the side of the equation with the unknown. Since we are adding 419 to s, we will subtract it from both sides of the equation.

$$\begin{array}{r} 419 + s = 510 - 419 \\ - 419 \\ \hline 0 \end{array}$$

This leaves us with: $s = 91$

Answer: The student will need to score a 91 on his last test to earn an average of 85 for the term.

B. Finding the Median

The median refers to the midpoint in a series of numbers.

To find the median, arrange the numbers in order from smallest to largest. If there is an odd number of values, the middle value is the median. If there is an even number of values, the average of the two middle values is the median.

Example #1: Find the median of 19, 29, 36, 15, and 20

In order: 15, 19, **20**, 29, 36 since there are 5 values (odd number), 20 is the median (middle number)

Example #2: Find the median of 67, 28, 92, 37, 81, 75

In order: 28, 37, **67**, **75**, 81, 92 since there are 6 values (even number), we must average those two middle numbers to get the median value

$$\text{Average: } \frac{67 + 75}{2} = \frac{142}{2} = 71 \text{ is the median value}$$

C. Finding the Mode

The mode of a set of values is the value that occurs most often. A set of values may have more than one mode or no mode.

Example #1: Find the mode of 15, 21, 26, 25, 21, 23, 28, 21

The mode is 21 since it occurs three times and the other values occur only once.

Example #2: Find the mode of 12, 15, 18, 26, 15, 9, 12, 27

The modes are 12 and 15 since both occur twice.

Example #3: Find the mode of 4, 8, 15, 21, 23

There is no mode since all the values occur the same number of times.

NAME: _____ DATE: _____ BLOCK
UNIT 6 (DATA) Mean, Median, Mode REVIEW

A. For the following groups of numbers, calculate the mean, median and mode for each.

1. 18, 24, 17, 21, 24, 16, 29, 18

Mean _____
Median _____
Mode _____

2. 75, 87, 49, 68, 75, 84, 98

Mean _____
Median _____
Mode _____

3. 55, 47, 38, 66, 56, 64, 44, 63, 39

Mean _____
Median _____
Mode _____

B. Solve the following word problems.

4. Cassandra's Candles sold the following number of candles over the last 6 days: 25, 48, 25, 33, 57, 50. What was the average number of candles sold each day?

5. Brian was comparison shopping for DVD players. He decided he wanted to purchase a DVD player that was in the middle of the price ranges. The prices he was quoted include the following: \$59.99, \$219.99, \$79.99, \$84.99, \$159.99, \$109.99, \$35.99. Which DVD player did Brian select?

6. Chad recently launched a new website. In the past six days, he has recorded the following number of daily hits: 37, 29, 37, 56, 45, 38. He is hoping at week's end to have an average number of 40 hits per day. To achieve this, how many hits must he have on the final day of the week?