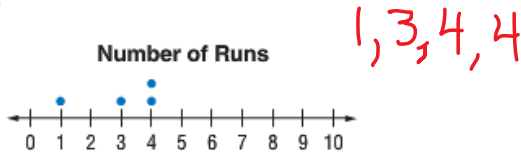


Measures of Center

✶ The **mean** of a set of data is the **sum of the items** in the set **divided by the number of items**. The mean can also be called the **average**. To find the mean, add all the data values and divide by the number of values.

The dot plot shows the number of runs a baseball team had for each game of a 4 game series. Find the mean number of runs for the series.



$$\text{mean} = \frac{1+3+4+4}{4}$$

← sum of the data
← number of data items

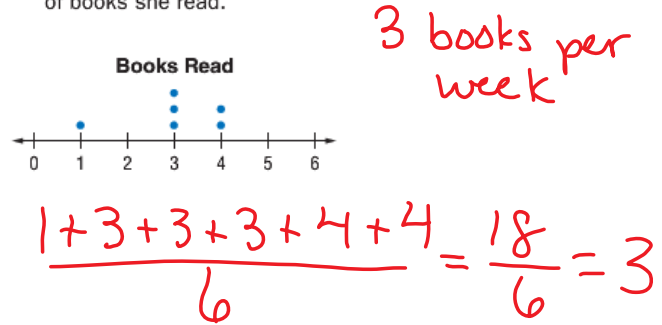
$$= \frac{12}{4} \text{ or } 3$$

Simplify.

The mean number of runs for the series is 3.

Got It? Do this problem to find out.

b. The dot plot shows the number of books Deanna read each week of a month-long reading challenge. Find the mean number of books she read.



$$\frac{1+3+3+3+4+4}{6} = \frac{18}{6} = 3$$

4. The number of minutes Mary Anne spent talking on her cell phone each month for the past five months were 494, 502, 486, 690, and 478. Suppose the mean for six months was 532 minutes. How many minutes did she talk on her cell phone during the sixth month?

If the mean is 532, the sum of the six pieces of data must be 532×6 or 3,192. You can create a bar diagram.

-----3,192-----					
494	502	486	690	478	?

$$3,192 - (494 + 502 + 486 + 690 + 478) = 3,192 - 2,650 = 542$$

Mary Anne talked 542 minutes during the sixth month.

2. The table shows the greatest depths of four of the five oceans in the world. If the average greatest depth is 8.094 kilometers, what is the greatest depth of the Southern Ocean? (Example 4) 7.24 km

Ocean	Greatest Depth (km)
Pacific	10.92
Atlantic	9.22
Indian	7.46
Arctic	5.63
Southern	■

4 oceans = 33.23 ←

$8.094 \times 5 = 40.47$ ← sum of 5 oceans

$40.47 - 33.23 = 7.24$

Sum of 5 - Sum of 4 oceans

✶ The **median** of a set of data is the **middle number** when the set of data is listed from lowest to highest. If a set of data has two middle numbers, the median is the average of the two middle numbers.

✶ The **mode** of a set of data is the **item that occurs most often**. If all items occur once, there is no mode. If several items occur "most often," each is a mode.

Examples



1. The table shows the number of monkeys at eleven different zoos. Find the median and mode of the data.

Number of Monkeys					
28	36	18	25	12	44
18	42	34	16	30	

Order the data from least to greatest.

Median ~~12, 16, 18, 18, 25, 28, 30, 34, 36, 42, 44~~ 28 is in the center.

Mode 12, 16, 18, 18, 25, 28, 30, 34, 36, 42, 44 18 occurs most often.

The median is 28 monkeys. The mode is 18 monkeys.

2. Dina recorded her scores on 7 tests in the table. Find the median and mode of the data.

Test Scores			
83	88	94	93
85	97	90	

Order the data from least to greatest.

~~83, 85, 88, 90, 93, 94, 97~~

Circle the number in the center. This is the median.

Circle the most frequently occurring numbers. This value is the mode.

The median is a score of 93. The mode is a score of 93.

Got It? Do these problems to find out.

b. Find the median and mode of the costs in the table.

Cost of Backpacks (\$)			
16.78	48.75	31.42	18.38
22.89	51.25	28.64	26.79

EVEN
~~16.78, 18.38, 22.89, 26.79, 28.54, 31.42, 48.75, 51.25~~

$$\frac{26.79 + 28.54}{2} = \frac{55.33}{2} = 27.665$$

No mode

c. Find and compare the median and mode of the costs in the table.

Cost of Juice (\$)			
1.65	1.97	2.45	2.87
2.35	3.75	2.49	2.87

Mode = 2.87

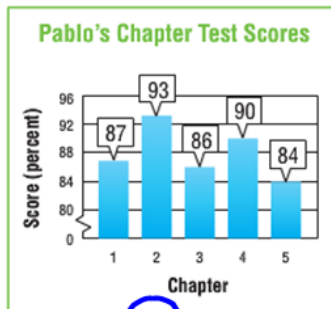
$$\text{Median} = \frac{2.45 + 2.49}{2} = 2.47$$

~~1.65, 1.97, 2.35, 2.87, 2.87, 3.75~~
 Mode > Median

Find the mean, median, and mode of the following sets of data. Round answers to the nearest tenth if necessary:

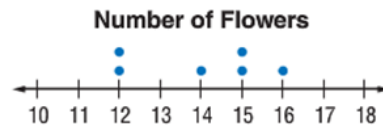
1

Mean = $\frac{440}{5} = 88$
 Median = 87
 Mode = none



84, 86, 87, 90, 93

2.



$$\text{Mean} = \frac{12 + 12 + 14 + 15 + 15 + 16}{6} = \frac{84}{6} = 14$$

$$\text{Median} = \frac{14 + 15}{2} = \frac{29}{2} = 14.5$$

Mode = 12 & 15

3 **Financial Literacy** Jamila babysat nine times. She earned \$15, \$20, \$10, \$12, \$20, \$16, \$80, and \$18 for eight babysitting jobs. How much did she earn the ninth time if the mean of the data set is \$24?

(Example 4)

Sum of 8 jobs = 191
 Sum of 9 jobs = $24 \times 9 = 216$

$$216 - 191 = \$25$$



H.O.T. Problems Higher Order Thinking

7. **Reason Abstractly** Create a data set that has five values. The mean of the data set should be 34. 32, 33, 34, 35, 36 SAMPLE

8. **Persevere with Problems** The mean of a set of data is 45 years. Find the missing numbers in the data set {40, 45, 48, ?, 54, ?, 45}. Explain the method or strategy you used.

SAMPLE: 41 and 42

$$40 + 45 + 48 + 54 + 45 = 232$$

$$45 \times 7 = 315$$

$$315 - 232 = 83$$

As the total sum is 45×7 , or 315, and the sum of the five known numbers is 232, the sum of the two missing numbers must be 83. You can then choose two numbers with a sum of 83 for your answer.