

Pre-Algebra: Week of May 4 – May 8, 2020

Time Allotment: 40 minutes per day

Student Name: _____

Teacher Name: _____

Packet Overview

Date	Objective(s)	Page Number
Monday, May 4	Evaluate statistical measures to compare the data: Calculate the range	2
Tuesday, May 5	Evaluate statistical measures to compare the data: Calculate the median and the mode.	4
Wednesday, May 6	Evaluate statistical measures to compare the data: Calculate the range, median, mean and mode	7
Thursday, May 7	Evaluate statistical measures to compare the data: Calculate the range, median, mean and mode ***Quiz***	10
Friday, May 8	Explain variance and explain/calculate frequency	12

Notes:

***Extra paper is not needed this week!! We included space for you to write your work directly in this packet on each day. Show your work where you can. All problems can be done in the packet, so all you need to submit at the end of this week is this completed packet!

***Checking/correcting your answers using a red pen is required!

Options to turn in completed packets:

1. Upload it to your Google Classroom! This allows for quicker review, more in-depth feedback and easier communication.
2. Physically turn it back in.

Guided Instruction via Zoom. For example, if you had Pre-Algebra with Mrs. Walters during Period 5, then on Tuesday and Thursday from 11-11:50 you can connect with her via Zoom.

	Monday	Tuesday	Wednesday	Thursday
10-10:50	Period 1	Period 4	Period 1	Period 4
11-11:50	Period 2	Period 5	Period 2	Period 5
11:50-1	Break			
1-1:50	Period 3	Period 6	Period 3	Period 6

Email Us: Patrick.Franzese@greatheartsnorthernnoaks.org or Melisa.Walters@greatheartsnorthernnoaks.org

Academic Honesty

I certify that I completed this assignment independently in accordance with the GHNO Academy Honor Code.
Student signature:

I certify that my student completed this assignment independently in accordance with the GHNO Academy Honor Code.
Parent signature:

Monday, May 4, 2020

Pre-Algebra: Chapter 12

Lesson: Statistics

Objective: Evaluate statistical measures to compare the data: Calculate the Range

Lesson Intro

Every discipline has unusual words that have simple meanings. English teachers will say that the word “buzz” is an example of onomatopoeia because it sounds like what it means. They will also say that the words “sum” and “some” are homophones because they sound the same but have different meanings. Mathematics also has unusual words whose meanings are simple. For example, when speaking about a series of measurements we use the mathematical terms **range** (the numerical difference between the least and greatest measurement), **median** (the middle measurement), **mode** (the measurement that appears the most frequently) and **mean** (and the average of the measurement). We will be studying all four this week!

Range

To show how these terms are used we use a real-life example. Let us say that the veterinarian weighed the first five dogs. Their weights in pounds were 10, 30, 8, 14, and 30. Then, the veterinarian weighed the next six dogs. Their weights in pounds were 4, 15, 4, 8, 15, and 18.

Students, I’d like you to arrange both sets of numbers from least to greatest and place in the table below:

	Set of numbers arranged from Least to Greatest
Weight of first 5 dogs	
Weight of the next 6 dogs	

***Please verify that the set of numbers that you just placed in order is to match below:*



We note that the set of numbers on the left above ranges from 8 lb to 30lb, so we say that the **range** of the set of numbers measuring the weight of the first 5 dogs is 30 minus 8, or 22. The set of numbers on the right above ranges from 4 lb to 18 lb, so we say that the **range** of the set of numbers measuring the weight of the next 6 dogs is 18 minus 4, or 14.

Your Turn to try it!

Example 1: In this set of numbers: 8, 11, 5, 9, 7, 6, 3616

What is the lowest number:

What is the highest number:

Calculate the range:

Pre-Algebra: Chapter 12 Statistics

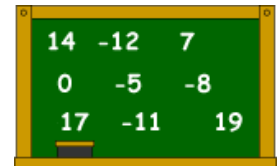
May 4 – May 8

Example 2: The Jaeger family drove through 6 midwestern states on their summer vacation. Gasoline prices varied from state to state. What is the range of gasoline prices?



\$1.79, \$1.61, \$1.96, \$2.09, \$1.84, \$1.75

Example 3: Mr. Franzese listed 9 integers on the blackboard. What is the range of these integers?



14, -12, 7, 0, -5, -8, 17, -11, 19

Example 4: A marathon race was completed by 5 participants. What is the range of times given in hours below?



2.7 hr, 8.3 hr, 3.5 hr, 5.1 hr, 4.9 hr

****Please check answer key before proceeding forward*

Exercises for Monday, May 4, 2020 *PLEASE circle answers here and not on an answer packet. Thanks!

1. What is the range of the first 4 even numbers greater than 7?
 - a. 8
 - b. 6
 - c. 7
2. Jeremy has 2 brothers and 3 sisters. His brothers are 2 years younger and 4 years younger than him. His sisters are 1 year, 4 years, and 6 years older than him. Jeremy is 9 years old. What is the range of the ages of Jeremy and his brothers and sisters?
 - a. 10
 - b. 2
 - c. 6
3. Leticia was 41 inches tall when she was 10 years old. Each year she grew 3 inches until she was 15 years old. What is the range of her height from age 10 to age 15.
 - a. 15
 - b. 56
 - c. 12

Tuesday, May 5, 2020

Pre-Algebra: Chapter 12

Lesson: Statistics

Objective: Evaluate statistical measures to compare the data: Calculate the median and the mode.**Median**

The median of a four-lane highway is the strip of grass/concrete that is in the middle of the highway. The word *median* comes to us from the Latin word *medius*, which means “middle”. We also use the word **median** to name the middle number in a set of numbers that are arranged in order from least to greatest. The set of numbers on the left below has an odd number of members (5), so it has a middle number, or median, which is 14.

Median



8, 10, 14, 30, 30

Median is 14.

Median



4, 4, 8, 15, 15, 18

Median is $\frac{8+15}{2} = 11.5$

The set of numbers on the right above has an even number of members (6), so there is no middle numbers. We say that the median of this set of numbers is the average of the two middle numbers, which is 11.5, as we show.

Try it!

1. Please fill in the blanks


MEDIAN	<ul style="list-style-type: none"> • The median is a measure of center in which the _____ of the data is determined. It can be found by: <ol style="list-style-type: none"> 1. Ordering the data from _____ to greatest 2. Determining the _____ of the data set • If there is not a middle number, then find the _____ of the two middle numbers.
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2. What is the median of the following number set: 3, 5, 6, 1, 4
3. What is the median of the following number set: 6, 6, 7, 5, 9, 9, 9


***Please check the answer key before moving forward.

Mode

The French word for “fashion” is *mode*, which comes from the Latin word *modus*. We use the word **mode** in data analysis to describe the number in a set of numbers that appears more than any other number and thus, is more fashionable. The number 30 appears more times than any other number in the set of numbers on the left below, so the mod of this set is the number 30.

8, 10, 14, 30, 30


Mode is 30

4, 4, 8, 15, 15, 18


Modes are 4 and 15

The set of numbers on the right has two modes – 4 and 15. A bicycle has two wheels because *bi* means “two”. Thus, we say that the set of numbers on the right above is **bimodal** because it has two modes.

Try it! Use the space below...not extra paper needed!

Class Exercises

Exercises 1-4 refer to the table below.

High Temperatures for June 10										
Year	1890	1900	1910	1920	1930	1940	1950	1960	1970	1980
Temperature (°C)	10	16	9	12	16	10	16	21	15	13

1. a. What is the lowest temperature listed?
 b. What is the highest temperature listed?
 c. What is the range of the temperatures?
3. a. List the temperatures in order from lowest to highest. Which two temperatures are at the middle of the list?
 b. What is the median of the temperatures?
4. a. Which temperatures occurred more than once?
 b. What is the mode of the temperatures?

***Please check the answer key before moving forward.

Exercises for Tuesday, May 5, 2020 ***Reminder fill in answers here.***

Written exercises page 452 #17, 18, 19

17. Insert another number into the set of data 11, 14, 16, 19 so that the median of the data is not changed.

18. Replace one of the numbers in the set of data 11, 14, 16, 19 so that the median of the data becomes 16.

19. Suppose that each number in a set of data is decreased by 5. How is the median of the data affected?

Wednesday, May 6, 2020

Pre-Algebra: Chapter 12

Lesson: Statistical Measures

Objective: Evaluate statistical measures to compare the data: Calculate the range, median, mean and mode.**Mean**

The average of a set of numbers is also called the **mean**. The average of a set of numbers is the sum of the numbers divided by the number of numbers in the set. You can think of it as determining the fair share. We compute the mean of each set of numbers as shown below:

$$\text{Take a set of 5 numbers: } 8, 10, 14, 30, 30 \qquad \text{Mean} = \frac{8+10+14+30+30}{5} = \frac{92}{5} = 18.4$$

$$\text{Take a set of 6 numbers: } 4, 4, 8, 15, 15, 18 \qquad \text{Mean} = \frac{4+4+8+15+15+18}{6} = \frac{64}{6} = 10.67$$

We use the word statistic to describe the mathematics used in the collection, organization, and interpretation of numerical data. A statistic can be a single measurement, but most often refers to a parameter such as range, median, mode, or mean that is obtained from the numerical data. We call the median, mode and mean measures of central tendency, for these statistics can sometimes help us to understand how a set of measurements is grouped about a central point. Suppose three measurements are 8, 10, and 11. The median (middle number) is 10 and the mean (average) is 9.67. Since both the median and the mean are close in value, they are considered meaningful statistics for this set of measurements. Since no one of the numbers occurs more frequently than the others, there is no mode.

Try it!**MEAN**

- The mean is a measure of center in which the _____ of the data is taken. It can be found by:
 1. Finding the _____ of all of the data points
 2. _____ by the number of data points
- The mean can be thought of as determining the _____.

Match each correct answer to a letter and complete the riddle below.

<p>1</p> <p>Determine the mean of the following numbers: 28, 40, 53, 39, 45</p>	<p>5</p> <p>Determine the median of the following numbers: 40, 49, 62, 56, 68, 39, 50, 61, 54, 44</p>										
<p>2</p> <p>The following list has a mean of 24. What would be the new mean if 17 was added to the list? 12, 30, 19, 27, 21, 35</p>	<p>6</p> <p>Find the median of the table below.</p> <table border="1" style="margin: 10px auto; border-collapse: collapse;"> <tr> <td style="padding: 5px;">NUMBER OF INCHES</td> <td style="padding: 5px;">20</td> <td style="padding: 5px;">22</td> <td style="padding: 5px;">24</td> <td style="padding: 5px;">26</td> </tr> <tr> <td style="padding: 5px;">FREQUENCY</td> <td style="padding: 5px;">3</td> <td style="padding: 5px;">2</td> <td style="padding: 5px;">1</td> <td style="padding: 5px;">3</td> </tr> </table>	NUMBER OF INCHES	20	22	24	26	FREQUENCY	3	2	1	3
NUMBER OF INCHES	20	22	24	26							
FREQUENCY	3	2	1	3							
<p>3</p> <p>A sixth number will be added to the list. What must it be in order for the mean to be 12? 7, 16, 11, 12, 10, ___</p>	<p>7</p> <p>The following list has a median of 43. What would be the new median if 21 was added to the list? 31, 48, 50, 23, 28, 52, 57, 38, 56, 27</p>										
<p>4</p> <p>Find the mean of the table below.</p> <table border="1" style="margin: 10px auto; border-collapse: collapse;"> <tr> <td style="padding: 5px;">NUMBER OF MINUTES</td> <td style="padding: 5px;">5</td> <td style="padding: 5px;">10</td> <td style="padding: 5px;">15</td> <td style="padding: 5px;">20</td> </tr> <tr> <td style="padding: 5px;">FREQUENCY</td> <td style="padding: 5px;">1</td> <td style="padding: 5px;">2</td> <td style="padding: 5px;">2</td> <td style="padding: 5px;">1</td> </tr> </table>	NUMBER OF MINUTES	5	10	15	20	FREQUENCY	1	2	2	1	<p>8</p> <p>Determine the median of the following numbers: 8, 11, 11, 12, 13, 15, 16, 16, 18, 21</p>
NUMBER OF MINUTES	5	10	15	20							
FREQUENCY	1	2	2	1							

C: 18	P: 35	S: 12.5	T: 14
E: 23	D: 41	L: 38	R: 52
Y: 22	M: 61	A: 16	O: 27

WHERE CAN YOU BUY A RULER THAT IS 3 FEET LONG?

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We have covered the statistical measures over the last few days. Now, let's put them all together. **Read pages 449-450 in your textbook** and answer the following questions:

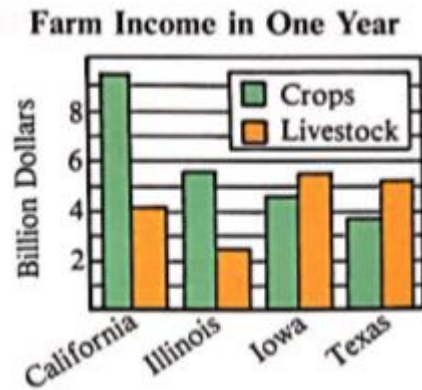
(a) On page 449, which class performed better and why?

(b) Using words, explain how the problem in Example 2 is solved:

***Please check the answer key before moving forward.

Exercises for Wednesday, May 6, 2020

Exercises 1 and 2 refer to the double bar graph at the right:



1. Which state had the greatest income from crops and livestock together?

2. About how much was the income from crops in Iowa?

3. There were 19 million telephones in the United States in 1940; 39 million in 1950; 66 million in 1960; 105 million in 1970; and 157 million in 1980. Make a line graph to illustrate these data.

4. Find the range, mean, median, and mode of the following set of data: 100, 103, 102, 103, 105, 102, 101, 102

5. Insert a new number into this set of data so that the mean of the resulting set of data is 15: 13, 21, 10.

Find the range, mean, median, and mode of the set of numbers. Round to the nearest tenth if necessary.

6. 67, 85, 26, 26, 38

Range:
Median:
Mode:
Mean:

7. 100, 101, 110, 90, 99, 99

Range:
Median:
Mode:
Mean:

Thursday, May 7, 2020

Pre-Algebra: Chapter 12

Lesson: Statistical Measures

Objective: Evaluate statistical measures to compare the data: Calculate the range, median, mean and mode.

****Please take the quiz on the last page **after** completing the problems below and checking your answers!****

Lesson: We have covered the statistical measures over the last few days. Now, let's put them all together and work out the problems.

Written exercises pg. 451 #1 – 16 all For problems 1 – 10: Find the range, mean, median, and mode of each of the following sets of data. Round to the nearest tenth if necessary. SHOW YOUR WORK!		
1. 12, 10, 8, 4, 3, 3, 2 Range: Median: Mode: Mean:	2. 50, 48, 35, 32, 31, 30 Range: Median: Mode: Mean:	3. 89, 102, 75, 85, 116, 62 Range: Median: Mode: Mean:
4. 83, 118, 143, 99, 194, 210, 153 Range: Median: Mode: Mean:	5. 12.6, 11.0, 10.1, 9.7, 8.9, 8.3 Range: Median: Mode: Mean:	6. 21.6, 30.2, 15.1, 28.8, 19.5 Range: Median: Mode: Mean:
7. 17, -9, -11, 23, 2, 0, -9 Range: Median: Mode: Mean:	8. 4.6, 2.3, 0, -1.2, -3.1, -5.6 Range: Median: Mode: Mean:	

<p>9. Points scored by the Basketeers in their most recent games: 98, 100, 96, 101, 99, 98, 101, 101, 100, 102</p> <p>Range: Median: Mode: Mean:</p>		
<p>10. Earned runs allowed by one pitcher in this season's games: 3, 2, 2, 4, 1, 0, 3, 3, 5, 2, 0, 0, 3, 5, 7, 2, 2, 1, 3, 4</p> <p>Range: Median: Mode: Mean:</p>		
<p>For problems 11-14: Insert a new number into the set of data so that the mean becomes the indicated number.</p>		
<p>11. 3, 9, 14; mean = 11</p>	<p>12. 5, 7, 10, 14; mean = 8</p>	<p>13. 6.3, 0.8, 1.2; mean = 4.7</p>
<p>14. -1, 0, 5, -7; mean = -7</p>		
<p>15. SOLVE: The heights of four of the starting players the basketball team are 183cm, 178 cm, and 185 cm. If the mean height of all five starting players is 182 cm, what is the height of the fifth starting player?</p>		
<p>16. SOLVE: A student's scores on the first four mathematics tests of the year were 80, 95, 92, and 89. What must the student score on the fifth test so that the mean score for all five tests is 90?</p>		

Friday, May 8, 2020

Pre-Algebra: Chapter 12

Lesson: Statistical Measures

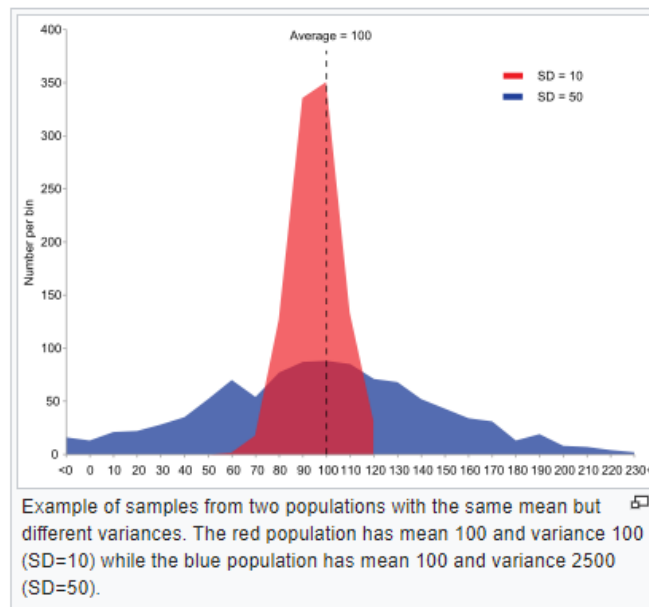
Objective: Explain variance and explain/calculate frequency

Lesson: In statistics, there are many ways to describe data. We have spent the majority of this week studying mean, mode, median and range. Today, we are going to introduce the concept of variance, which we will explore in greater detail next week, and frequency, which we will explore in-depth today.

Variance

Variance measures how far a set of numbers are spread out from their average value. A low variance indicates that the values tend to be close to the mean of the set, while a high standard deviation indicates that the values are spread out over a wider range. Some of you may have heard the term standard deviation before, which is related to variance. Essentially, the standard deviation is the square root of the variance. Or, if you like, the variance is the square of the standard deviation.

Look at the chart below and see how standard deviation and variance are related.



So why is variance and standard deviation important? Because it tells you how diverse the data set is, which then informs how you should interpret that data. Typically, if there is a greater variation or standard deviation, the interpretations of that data are less reliable. Again, we will explore this concept more in-depth next week!

Frequency

In statistics, a frequency distribution is a list, table or graph that displays the frequency of various outcomes in a sample. Each entry in the table contains the frequency or count of the occurrences of values within a particular group or interval.

Read pages 453-454 in your textbook and answer the following questions:

- (a) When you need to analyze a large amount of data, a statistic that is often used is _____.
- (b) What is the frequency of an item? _____
- (c) A table that pairs each item of data with its frequency is called a _____.
- (d) A frequency distribution can help us find other statistics. How can it help us compute the mode: _____
- (e) When a set of data has a very large range, it is usually more convenient to make a frequency distribution by _____.

Try It! Again, use the space below...not extra paper needed!

Class Exercises

The data below represent the scores of a class of 24 students who took a 5-point quiz. Exercises 1 and 2 refer to these data.

5 5 2 4 5 3 3 3 4 2 5 4
 3 4 4 3 2 4 4 2 3 2 3 5

- 1. Complete the frequency distribution shown at the right.
- 2. Find the following statistics for these data.
 - a. range
 - b. mean
 - c. median
 - d. mode

Score x	Frequency f	$x \times f$
1	?	?
2	?	?
3	?	?
4	?	?
5	?	?
Total	24	?

***Please check the answer key before moving forward.

Exercises for Friday, May 8, 2020

Written exercises page 455 #1-2, 7-12, 19-22																													
Make a frequency distribution for the given data.	Make a frequency distribution for the given data.																												
1. 5, 6, 6, 6, 6, 7, 7, 7, 8, 8, 8, 9	2. 6, 6, 7, 7, 7, 7, 9, 9, 9, 10, 10, 10																												
For exercises 7 – 10, x represents an item of data and f represents the frequency of the item. Compute the following: a. range b. mean c. median d. mode																													
7. <table style="display: inline-table; border-collapse: collapse; vertical-align: middle;"> <thead> <tr><th style="border-bottom: 1px solid black; border-right: 1px solid black; padding: 0 5px;">x</th><th style="border-bottom: 1px solid black; padding: 0 5px;">f</th></tr> </thead> <tbody> <tr><td style="border-right: 1px solid black; padding: 0 5px;">6</td><td style="padding: 0 5px;">2</td></tr> <tr><td style="border-right: 1px solid black; padding: 0 5px;">7</td><td style="padding: 0 5px;">6</td></tr> <tr><td style="border-right: 1px solid black; padding: 0 5px;">8</td><td style="padding: 0 5px;">7</td></tr> <tr><td style="border-right: 1px solid black; padding: 0 5px;">9</td><td style="padding: 0 5px;">4</td></tr> <tr><td style="border-right: 1px solid black; padding: 0 5px;">10</td><td style="padding: 0 5px;">1</td></tr> </tbody> </table>	x	f	6	2	7	6	8	7	9	4	10	1	8. <table style="display: inline-table; border-collapse: collapse; vertical-align: middle;"> <thead> <tr><th style="border-bottom: 1px solid black; border-right: 1px solid black; padding: 0 5px;">x</th><th style="border-bottom: 1px solid black; padding: 0 5px;">f</th></tr> </thead> <tbody> <tr><td style="border-right: 1px solid black; padding: 0 5px;">0</td><td style="padding: 0 5px;">2</td></tr> <tr><td style="border-right: 1px solid black; padding: 0 5px;">3</td><td style="padding: 0 5px;">3</td></tr> <tr><td style="border-right: 1px solid black; padding: 0 5px;">6</td><td style="padding: 0 5px;">5</td></tr> <tr><td style="border-right: 1px solid black; padding: 0 5px;">9</td><td style="padding: 0 5px;">3</td></tr> <tr><td style="border-right: 1px solid black; padding: 0 5px;">12</td><td style="padding: 0 5px;">2</td></tr> </tbody> </table>	x	f	0	2	3	3	6	5	9	3	12	2				
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4	5																												
6	4																												
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5	6																												
6	2																												
7	6																												
8	3																												
9	1																												

For #11 and #12, Make a frequency distribution for the given data, then use it to compute the range, mean, median, and mode of the data.
<p>11. Numbers of puppies in fourteen litters: 3, 5, 4, 4, 7, 8, 5, 3, 4, 6, 7, 8, 2, 4</p> <p>a. Range: b. Mean: c. Median: d. Mode:</p>

12. Numbers of peas in sixteen pods:

6, 5, 2, 9, 12, 6, 5, 6, 11, 9, 6, 4, 7, 8,
10, 6

- a. Range:
- b. Mean:
- c. Median:
- d. Mode:

19. The mean of 10 numbers is 15. What is the sum of the numbers?

20. The sum of a set of numbers is 120 and the mean is 10. How many numbers are in this set?

Exercises 21 and 22 refer to a class that consists of 15 girls and 25 boys.

21. On test *A*, the mean of the girls' scores was 80 and the mean of the boys' scores was 70. What was the class mean?

22. On test *B*, the class mean was 80 and the mean of the girls' scores was 75. What was the mean of the boys' scores?

ANSWER KEY

Answers to Exercises for Monday, May 4, 2020

Try It!

<p>Example 1: In this set of numbers: 8, 11, 5, 9, 7, 6, 3616 What is the lowest number: 5 What is the highest number: 3616 Calculate the range: $3616 - 5 = 3611$.</p>	<p>Example 3: Solution: Ordering the data from least to greatest, we get: $-12, -11, -8, -5, 0, 7, 14, 17, 19$ highest - lowest = $19 - -12 = 19 + 12 = +31$ Answer: The range of these integers is +31.</p>
<p>Example 2: Solution: Ordering the data from least to greatest, we get: \$1.61, \$1.75, \$1.79, \$1.84, \$1.96, \$2.09 highest - lowest = $\\$2.09 - \\$1.61 = \\$0.48$ Answer: The range of gasoline prices is \$0.48.</p>	<p>Example 4: Solution: Ordering the data from least to greatest, we get: 2.7, 3.5, 4.9, 5.1, 8.3 highest - lowest = $8.3 \text{ hr} - 2.7 \text{ hr} = 5.6 \text{ hr}$ Answer: The range of swim times is 5.6 hr.</p>

Exercise problem set:

1. Answer b. 6
2. Answer a. 10
3. Answer a. 15 inches

Answers to Exercises for Tuesday, May 5, 2020

Try it! answers

1.

MEDIAN

- The median is a measure of center in which the middle of the data is determined. It can be found by:
 1. Ordering the data from least to greatest
 2. Determining the middle of the data set
- If there is not a middle number, then find the average (mean) of the two middle numbers.

2. 4
3. 8

Try It! Classroom Exercises 1, 3, 4

1. a. 9°C b. 21°C c. $21 - 9 = 12; 12^\circ\text{C}$

3. a. $9^{\circ}\text{C}, 10^{\circ}\text{C}, 10^{\circ}\text{C}, 12^{\circ}\text{C}, 13^{\circ}\text{C}, 15^{\circ}\text{C}, 16^{\circ}\text{C}, 16^{\circ}\text{C}, 16^{\circ}\text{C}, 21^{\circ}\text{C}; 13^{\circ}\text{C}$ and 15°C

b. $\frac{13 + 15}{2} = 14; 14^{\circ}\text{C}$

4. a. 10°C and 16°C b. 16°C

Written exercises page 452 #17, 18, 19

17. The present median is $\frac{14 + 16}{2} = 15$. If 15 is inserted into the data, the median will remain 15.

18. The median of four numbers is the average of the middle two. If either 11 or 14 is replaced by 16, the median will be 16.

19. The median is decreased by 5.

Answers to Exercises for Wednesday, May 6, 2020

Try it!

MEAN

- The mean is a measure of center in which the sum of the data is taken. It can be found by:
 1. Finding the sum of all of the data points
 2. Dividing by the number of data points
- The mean can be thought of as determining the fair share.

Where can you by a ruler that is three feet long?

- | | |
|------------|----------|
| 1. 41(D) | 5. 52(R) |
| 2. 23(E) | 6. 22(Y) |
| 3. 16(A) | 7. 38(L) |
| 4. 12.5(S) | 8. 14(T) |

A T A Y A R D S A L E
 3 8 3 6 3 5 1 4 3 7 2

Pages 449-450 in your textbook:

(a) On page 449, which class performed better and why? *Class A. Significantly, Class A had a higher average and higher median (which means the top half of Class A did better than Class B). Class A also had a small smaller range and higher mode, but those are less meaningful in this case.*

(b) Using words, explain how the problem in Example 2 is solved: *In order for 4 numbers to have the average of 17, you know that those 4 numbers have to add up to 4 times 17 or 68. Since you know that the three numbers you were given (12, 15 and 21) add up to 48, you simply subtract 48 from 68 and you get 20.*

Exercises #1-7

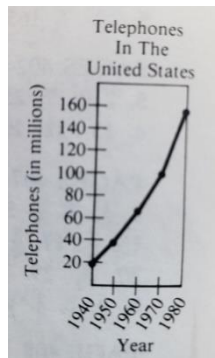
Answers: 1. California 2. \$4.5 billion 3.

4. 5, 102.25, 102, 102

5. 16

6. 59, 48.4, 38, 26

7. 20, 99.8, 99.5, 99



Answers to Exercises for Thursday, May 7, 2020

Written exercises pg. 451 #1 – 16 all

1. range = $12 - 2 = 10$; mean = $\frac{12 + 10 + 8 + 4 + 3 + 3 + 2}{7} = \frac{42}{7} = 6$; median = 4; mode = 3

2. range = $50 - 30 = 20$; mean = $\frac{50 + 48 + 35 + 32 + 31 + 30}{6} = \frac{226}{6} \approx 37.7$; median = $\frac{32 + 35}{2} = 33.5$; no mode

3. 116, 102, 89, 85, 75, 62; range = $116 - 62 = 54$; mean = $\frac{116 + 102 + 89 + 85 + 75 + 62}{6} = \frac{529}{6} \approx 88.2$; median = $\frac{85 + 89}{2} = 87$; no mode

4. 210, 194, 153, 143, 118, 99, 83; range = $210 - 83 = 127$; mean = $\frac{210 + 194 + 153 + 143 + 118 + 99 + 83}{7} = \frac{1000}{7} \approx 142.9$; median = 143; no mode

5. range = $12.6 - 8.3 = 4.3$; mean = $\frac{12.6 + 11.0 + 10.1 + 9.7 + 8.9 + 8.3}{6} = \frac{60.6}{6} = 10.1$; median = $\frac{9.7 + 10.1}{2} = 9.9$; no mode

6. 30.2, 28.8, 21.6, 19.5, 15.1; range = $30.2 - 15.1 = 15.1$; mean = $\frac{30.2 + 28.8 + 21.6 + 19.5 + 15.1}{5} = \frac{115.2}{5} = 23.0$; median = 21.6; no mode

7. 23, 14, 2, 0, -9, -9, -11; range = $23 - (-11) = 34$; mean = $\frac{23 + 14 + 2 + 0 - 9 - 9 - 11}{7} = \frac{10}{7} \approx 1.4$; median = 0; mode = -9

$$8. \text{ range} = 4.6 - (-5.6) = 10.2; \text{ mean} = \frac{4.6 + 2.3 + 0 - 1.2 - 3.1 - 5.6}{6} = \frac{-3}{6} = -0.5;$$

$$\text{median} = \frac{0 - 1.2}{2} = -0.6; \text{ no mode}$$

$$9. 102, 101, 101, 101, 100, 100, 99, 98, 98, 96; \text{ range} = 102 - 96 = 6; \text{ mean} =$$

$$\frac{102 + 101 + 101 + 101 + 100 + 100 + 99 + 98 + 98 + 96}{10} = \frac{996}{10} = 99.6; \text{ median} = 100;$$

$$\text{mode} = 101$$

$$10. 7, 5, 5, 4, 4, 3, 3, 3, 3, 2, 2, 2, 2, 2, 1, 1, 0, 0, 0; \text{ range} = 7 - 0 = 7;$$

$$\text{mean} = \frac{7 + 5 + 5 + 4 + 4 + 3 + 3 + 3 + 3 + 2 + 2 + 2 + 2 + 2 + 1 + 1 + 0 + 0 + 0}{20} =$$

$$\frac{52}{20} = 2.6; \text{ median} = \frac{3 + 2}{2} = 2.5; \text{ modes} = 2 \text{ and } 3$$

$$11. \frac{3 + 9 + 14 + x}{4} = 11, 3 + 9 + 14 + x = 4(11), 26 + x = 44, x = 44 - 26 = 18; \text{ new}$$

number is 18.

$$12. \frac{5 + 7 + 10 + 14 + x}{5} = 8, 5 + 7 + 10 + 14 + x = 5(8), 36 + x = 40, x = 40 - 36 = 4;$$

new number is 4.

$$13. \frac{6.3 + 0.8 + 1.2 + x}{4} = 4.7, 6.3 + 0.8 + 1.2 + x = 4(4.7), 8.3 + x = 18.8, x = 18.8 - 8.3 =$$

10.5; new number is 10.5.

$$14. \frac{-1 + 0 + 5 - 7 + x}{5} = -7, -1 + 0 + 5 - 7 + x = 5(-7), -3 + x = -35, x = -35 + 3 = -32;$$

new number is -32.

$$15. \text{ Let } x = \text{ the height of the fifth player. } \frac{183 + 178 + 174 + 185 + x}{5} = 182, 183 + 178 +$$

$$174 + 185 + x = 5(182), 720 + x = 910, x = 910 - 720 = 190; \text{ the height is } 190 \text{ cm.}$$

$$16. \text{ Let } x = \text{ the score on the fifth test. } \frac{80 + 95 + 92 + 89 + x}{5} = 90, 80 + 95 + 92 + 89 +$$

$$x = 5(90), 356 + x = 450, x = 450 - 356 = 94; \text{ the student must score } 94.$$

Answers to Exercises for Friday, May 8, 2020

Read pages 453-454 in your textbook and answer the following questions:

- When you need to analyze a large amount of data, a statistic that is often used is *frequency*.
- What is the frequency of an item? *It is the number of times that the number can occur.*
- A table that pairs each item of data with its frequency is called a *frequency distribution*.
- A frequency distribution can help us find other statistics. How can it help us compute the mode: *By definition, the item with the greatest frequency is the mode!*
- When a set of data has a very large range, it is usually more convenient to make a frequency distribution by *grouping the data into intervals.*

Try It, Page 454:

1.

x	f	$x \times f$
1	0	0
2	5	10
3	7	21
4	7	28
5	5	25
Total	24	84

2. a. range = $5 - 2 = 3$ b. mean = $\frac{84}{24} = 3.5$

c. There are 24 items. The median is the average of the 12th and 13th. median =

$$\frac{3 + 4}{2} = 3.5$$

d. modes = 3 and 4.

Page 455 #1-2, 7-12, 19-22

1.

x	f
5	1
6	4
7	3
8	3
9	1

2.

x	f
6	2
7	4
9	3
10	3

7.

x	f	$x \times f$
6	2	12
7	6	42
8	7	56
9	4	36
10	1	10
Total	20	156

a. range = $10 - 6 = 4$

b. mean = $\frac{156}{20} = 7.8$

c. median = $\frac{10\text{th} + 11\text{th}}{2} = \frac{8 + 8}{2} = 8$

d. mode = 8

8.

x	f	$x \times f$
0	2	0
3	3	9
6	5	30
9	3	27
12	2	24
Total	15	90

a. range = $12 - 0 = 12$

b. mean = $\frac{90}{15} = 6$

c. median = 8th term = 6

d. mode = 6

9.

x	f	$x \times f$
2	3	6
4	5	20
6	4	24
8	5	40
10	4	40
12	4	48
Total	25	178

a. range = $12 - 2 = 10$
 b. mean = $\frac{178}{25} = 7.12$
 c. median = 13th term = 8
 d. modes = 4 and 8

10.

x	f	$x \times f$
4	2	8
5	6	30
6	2	12
7	6	42
8	3	24
9	1	9
Total	20	125

a. range = $9 - 4 = 5$
 b. mean = $\frac{125}{20} = 6.25$
 c. median = $\frac{10\text{th} + 11\text{th}}{2} = \frac{6 + 7}{2} = 6.5$
 d. modes = 5 and 7

11.

x	f	$x \times f$
2	1	2
3	2	6
4	4	16
5	2	10
6	1	6
7	2	14
8	2	16
Total	14	70

range = $8 - 2 = 6$;
 mean = $\frac{70}{14} = 5$;
 median = $\frac{7\text{th} + 8\text{th}}{2} = \frac{4 + 5}{2} = 4.5$;
 mode = 4

12.

x	f	$x \times f$
2	1	2
4	1	4
5	2	10
6	5	30
7	1	7
8	1	8
9	2	18
10	1	10
11	1	11
12	1	12
Total	16	112

range = $12 - 2 = 10$;
 mean = $\frac{112}{16} = 7$;
 median = $\frac{8\text{th} + 9\text{th}}{2} = \frac{6 + 6}{2} = 6$;
 mode = 6

19. Let s = the sum. $\frac{s}{10} = 15$, $s = 10(15) = 150$; the sum is 150.

20. Let n = the number of numbers in the set. $\frac{120}{n} = 10$, $120 = 10n$, $n = 12$; 12 numbers are in the set.

21. Let m = the class mean. $15(80) + 25(70) = (15 + 25)m$, $1200 + 1750 = 40m$, $2950 = 40m$, $m = \frac{2950}{40} = 73.75$; the class mean was 73.75.

22. Let m = the mean of the boys' scores. $15(75) + 25m = (15 + 25)80$, $1125 + 25m = 3200$, $25m = 3200 - 1125 = 2075$, $m = \frac{2075}{25} = 83$; the mean of the boys' scores was 83.

Quiz

You can use a calculator, but you must show your work!!

For problems 1 – 2: Find the range, mean, median, and mode of each of the following sets of data.

1. 7, 6, 13, 22, 4, 6, 7, 18, 7	2. 13, -10, -15, 3, 13, 0, -4
Range: Median: Mode: Mean:	Range: Median: Mode: Mean:

For problems 3-4: What number do you have to insert into the set of data so that the mean becomes the indicated number. Box your answer!

3. 6, 9, 12; mean = 10
4. -10, 0, 6, -3; mean = -3
5. SOLVE: The grades of four of tests are 96%, 92%, 88% and 98%. If the mean percent score of 5 tests this semester is 93%, what is percent score of the fifth test?