

warm up: Fill in the 3 blanks below and do example 1.

I. Central Tendency & Dispersion

Mean, Median, Mode & Range:

mean is the sum of the data values divided by the number of values.

median is the number in the middle of a set of data values.

mode is the value that occurs most often in a set of data values.

Example 1:

Assume that the girls' soccer team scored 0, 2, 6, 1 and 3 goals in its last five games. Find the mean, median and mode.

0, 1, 2, 3, 6

$$\text{mean} = \frac{12}{5} = 2.4 \text{ goals}$$

$$\text{median} = 2 \text{ goals}$$

$$\text{mode} = \text{none}$$

Georgia is purchasing treats for her classmates. Georgia can spend exactly \$10.00 to purchase 25 fruit bars, each equal in price. Georgia can also spend exactly \$10.00 to purchase 40 granola bars, each equal in price.

- A. Write an equation which can be used to find all combinations of fruit bars (x) and granola bars (y) that will cost exactly \$10.00.

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{40 - 0}{0 - 25} = \frac{40}{-25} = -1.6$$

$$\begin{aligned} y - 0 &= -1.6(x - 25) \\ y &= -1.6x + 40 \end{aligned}$$

equation: $y = -1.6x + 40$

a = cost fruit bars

b = cost granola bars

$$\frac{25a}{25} = \frac{10}{25}$$

$$a = .4$$

$$\frac{40b}{40} = \frac{10}{40}$$

$$b = .25$$

$$.4x + .25y = 10$$

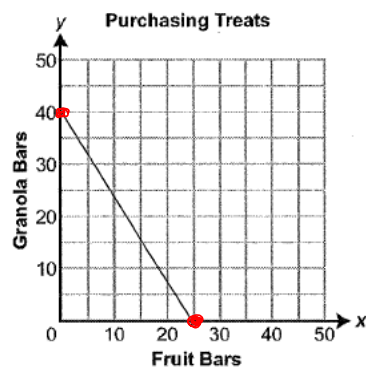
OR

$$\begin{aligned} .4x + .25y &= 10 \\ -.4x & \quad \quad -.4x \end{aligned}$$

$$\frac{.25y}{.25} = \frac{-.4x + 10}{.25}$$

$$y = -1.6x + 40$$

B. Graph the equation from part A below.



C. What is the slope of the line graphed in part B?

slope: -1.6 or $-\frac{8}{5}$

D. Explain what the slope from part C means in the context of Georgia purchasing treats.

$-\frac{8}{5}$ granola
 5 fruit

For every 5 fruit bars she buys, she can buy 8 less granola bars.

or

$\frac{8}{-5}$ For every 8 granola bars she buys, she can buy 5 fewer fruit bars.

Example 2:

The selling prices of 5 houses in one neighborhood were \$114,000, \$150,000, \$223,000, \$198,000, and \$139,000. Which conclusion is true?

- ☒ A The mean price was about \$15,000 higher than the median price.
- ☐ B The median price was about \$15,000 higher than the mean price.
- ☐ C The mean and median prices were identical.
- ☐ D The mean price was double the median price.

114 000 139 000 150 000 198 000 223 000

median = 150,000

mean = 164,800

range is a measure of dispersion that is computed by finding the difference between the highest and lowest numbers in a data set.

← Spread

Example 3:

- a) Among the 30 people at a picnic, the youngest person is 3 years old, and the oldest person is 79 years old. What is the range?

$$\text{range} = 79 - 3 = 76 \text{ years}$$

- b) At another picnic, the youngest person is 10 years old and the range is 21. What can you say about the oldest person?

$$\text{oldest is } 10 + 21 = 31 \text{ years old.}$$

Example 4:

A company asked 7 employees to turn in receipts for their travel expenses. The expenses were separated into transportation (plane travel, car rental, taxi) and lodging (hotel rooms, meals).

TRAVEL EXPENSES

Employee	Transportation	Lodging
Watkins	\$460	\$534
Sawamura	\$912	\$350
Jensen	\$794	\$483
Stolzfus	\$329	\$311
McManus	\$409	\$612
Escobar	\$211	\$543
Chang	\$902	\$433

ranges:

trans → 701

lodging → 301

A Which was more spread out, the transportation expenses or the lodging expenses? Justify your answer.

(compute the range for each & compare)

Transportation is more spread out. Its range is \$701 while the

B The company is planning to send another employee on a business trip. About how much money, in all, should the company expect the employee to spend on the trip? Explain how you determined the answer.

range of lodging is only \$301.

(find the medians of trans & lodging, then add)

medians: 460 trans
483 lodg

The can expect to spend about \$943

on another employee. I found the median of each category and added them.

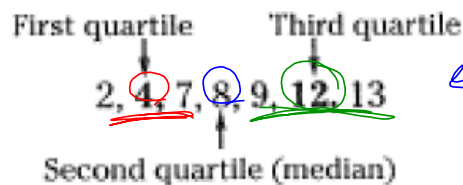
Quartiles and Interquartile Range

(after put in order)

When data are divided into fourths, the divisions between the groups of data are called quartiles.

- The **first quartile** is the median of the lower half of the data.
- The **second quartile** is the median of all of the data.
- The **third quartile** is the median of the upper half of the data.
- The **interquartile range** is the range between the third and first quartiles.

1QR →



The 1QR is
 $Q3 - Q1 = 12 - 4 = 8$

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The quartiles and interquartile range lead to various statements that can be made about data:

- Roughly one-fourth of data fall below the first quartile.
- Roughly one-fourth of data fall above the third quartile.
- Roughly one-half of data (the middle 50%) fall between the first and third quartiles.
- The interquartile range is a measure of how spread out the middle 50% of the data are.

Example 5:

A scientist recorded the temperature, in degrees Celsius, in 12 different parts of a rainforest. Her results are shown below.

11, 14, 12, 15, 8, 16, 21, 10, 11, 17, 13, 10

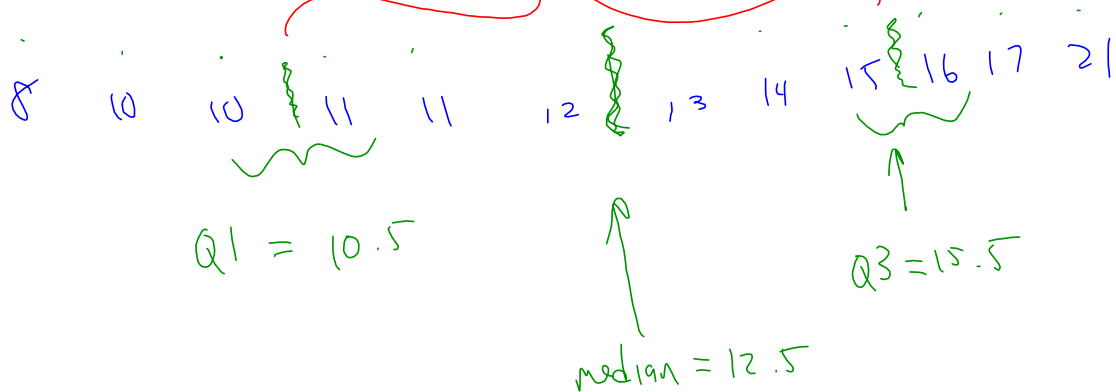
What is the interquartile range, in degrees Celsius, of the temperatures?

A 0.5

B 2.0

C 4.5

D 5.0



$$IQR = 15.5 - 10.5 = 5$$

Homework:

pages 3-5 #1-10 (multiple choice)
and
page 15 (open ended)