6.1 Describing Data

ALGEBRA

Write your questions here!

Data:

Mean:

Median:

Mode:

Range:

I'm "mean!"

Consider the following set of data which describes the lengths of 6 naps that Mr. Brust took over a two-week period, in minutes:

38	40	44	45	45	58

Mean: Mode: Median: Range:

The following data describes the lengths of 6 naps that Mr. Bean took over that same period:

18	25	30	42	55	100

Mean: Mode: Median: Range:

Using technology to help!! (Not required, but awesome!)

TI83/TI84

To clear your Calc's memory:
2nd + 7 1 2

To enter your data into the calculator:
stat enter

To find the mean:
2nd stat ▶ ▶ 3 2nd 1 enter enter enter

To find the Standard Deviation

2nd stat ▶ ▶ 7 2nd 1 enter enter enter

SMP #5

APPS FOR YOUR SMARTPHONE:

IOS (IPHONE)

GraphNCalc83
By Ernest Brock

Android

Wabbitemu

BuckeyeDude Education

Justify!! Who takes longer naps, Brust or Bean? Whose naps are more consistent? Justify each answer with a complete sentence.

Standard Deviation

One way to measure how spread out, or the variation, of a data set is to use the standard deviation.

Finding the Standard Deviation:

$$s = \sqrt{\frac{(x_1-\bar{x})^2+(x_2-\bar{x})^2+\cdots+(x_n-\bar{x})^2}{n-1}}$$

Step:	Reason why:
1. Find the mean of the data set.	We need to find the "middle" of the data set
2. Subtract the mean from each value	We need to find how far away from the middle each value is.
3. Square the differences found in Step 2	We need these values to be positive.
4. Add those squares (found in Step 3)	We need to find the "average difference"
5. Divide the sum by (n-1)	
6. Take the square root	We need to "undo" the squaring in step 3.

Find the standard deviation of the length of Brust's naps in minutes:						
Length of nap	38	40	44	45	45	58
Dev. From mean						
Sq. dev from mean						

Sum of squares: Divide by n -1:   Square Root:

Standard Deviation:

Find the standard deviation of the length of Bean's naps in minutes:						
Length of nap						
Dev. From mean						
Sq. dev from mean						

Sum of squares: Divide by n -1:   Square Root:

Standard Deviation:

What does the standard deviation tell us about the difference between Mr. Brust's and Mr. Bean's naps?

Find the value of x.

a. 13, 9, *x,* 9, 4, 17   The mean is 12.   b.   90, 25, *x*, 20 ; The median is 27.

SUMMARY:

Now, summarize your notes here!

The following represents the test scores of a sample of students from each of the Algebros' classes:

Mr. Bean	Mr. Brust	Mr. Kelly	Mr. Sullivan
85 60 88 95 90 77	100 50 78 92 100	81 82 84 90 84 83	60 92 96 88 90 92 98

1. Fill in the table, rounding values to the nearest tenth when necessary:

	Mr. Bean	Mr. Brust	Mr. Kelly	Mr. Sullivan
Mean				
Median				
Range				
Standard Deviation				

    a. Which Algebro's sample has the highest mean?

    b. If you were Mr. Brust, would you use the mean or the median to describe your data if you wanted to show your test scores were the highest?

    c. Which Algebro's students were the most consistent? Justify by talking about the standard deviation.

2. **Find the value of x.**

    a. $3, 9, 10, 8, 7, x$. The mean is 7.

    b. $35, 20, x, 90$; The median is 41.

    c. $35, 100, x, 20, 90$; The median is 41.

    d. $25, 55, x, 90, 10$; The mean is 50.

3. Sully LOVES going to basketball games and counting rebounds. Sully goes to the Kaiserslautern-Ramstein faculty game and counts the following rebounds during the first half:

Kaiserslautern Raiders (Rebounds in first half)	
Hemmer	1
Fairchild	5
Rodriguez	3
Powdar	13
Standiford	3

Ramstein Royals (Rebounds in first half)	
Bradley	0
Kretz	12
Hollenbeck	1
Brewster	1
Marks	6

a. Which of the following statements is (are) true?
   I.   The rebound range is greater for Ramstein than it is for Kaiserslautern.
   II.   The mean number of rebounds is less than 10 for both teams.
   III. The standard deviation of rebounds is greater for Ramstein.
   IV.   The rebound range is greater for Kaiserslautern than it is for Ramstein.
   V.   None of the above statements are true.

During the second half, Sully notices the following facts about the game's final stats:

- Kaiserslautern's team had a mean of 14 rebounds and a standard deviation of 0 rebounds.
- Ramstein's team had a range of 12 rebounds and a median of 12 total rebounds.

Fill in the tables with **possible numbers** of total rebounds based on the facts above.

Kaiserslautern Raiders Total Rebounds	
Hemmer	
Fairchild	
Rodriguez	
Powdar	
Standiford	

Ramstein Royals Total Rebounds	
Bradley	
Kretz	
Hollenbeck	
Brewster	
Marks	

b. Explain what has to happen for a data set to have a standard deviation of 0.

1. The following represents the number of grams of fat in a sample of popular candy:

   1.2, 1.6, 10.2, 6.6, 0.9

   Find the mean and standard deviation of the data set to the nearest tenth.

Mean = _____   Standard Deviation = _____

2. Sully finds the average age of his Algebra II class is 16.2 years old. Suppose exactly one year later, Sully has the exact same students in his PreCalc class.

   a. Describe how the mean and the median of the class would change from one year to the next.

   b. Describe how the range and standard deviation would change from one year to the next.

A1 4.1 EXIT TICKET –

Suppose a teacher plans to give four students a quiz. The minimum possible score is a 0 while the maximum possible score is a 10.

a. What is the smallest possible standard deviation of the students' scores? Give an example of a possible set of four student scores that would have this standard deviation.

b. What is the set of four student scores that would make the standard deviation as large as it could possibly be? Use your calculator to find this largest possible standard deviation.