1-Var Stats L1

Press **ENTER** and view the calculations. Use the down arrow to view all of the information.

$\bar{X}$ = mean

$\sum X$ = the sum of the data

$\sum X^2$ = the sum of the squares of the data

Sx = the sample standard deviation

σ_x = the population standard deviation

n = the sample size (# of pieces of data)

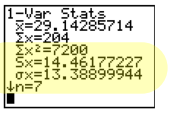
min X = the smallest data entry

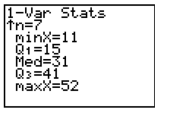
Q_1 = data at the first quartile

med = data at the median (second quartile)

Q_3 = data at the third quartile

max X = the largest data entry





Which Standard Deviation to use

When do you use the sample Standard Deviation and when do you use the population Standard Deviation ?

If the data consist of information from the entire population of whatever is being analyzed then you the POPULATION Standard deviation.

If the data consists of a sample of the population and not the entire population, then use the SAMPLE standard deviation.

Which Standard Deviation to use

1 - In a study of the land areas of the 50 U.S. states, the area of each of the 50 states is used.

2. **A study of heights of high school students in a school of 1,200 students, the heights of 100 students chosen at random are used.**

3. **In a study of heights of high school students in the U.S., the heights of 100 students from EACH of the 50 states were recorded.**

What is standard deviation?

The following compares the heights (in inches) of 14 volleyball players from two different teams:

Team 1: 78,62,60,68,75,72,58,54,66,61,62,58,70,77

Team 2:
55,78,54,80,62,58,77,76,50,56,75,75,79,55

Compare the two teams by computing the mean and the standard deviation for each team.

Team # 1: Avg (mean) = 65.8
Pop. Standard Deviation = 7.4

Team # 2: Avg (mean) = 66.4
Pop. Standard Deviation = 11.1

What does standard deviation mean?

Standard deviation is a simple measure of the variability or dispersion of a data set.

A low standard deviation indicates that the data points tend to be very close to the same value (the mean).

A high standard deviation indicates that the data are "spread out" over a large range of values.

What do you know about the teams?

Team # 1: Avg (mean) = 65.8
Pop. Standard Deviation = 7.4

Team # 2: Avg (mean) = 66.4
Pop. Standard Deviation = 11.1

Team 2 has a greater height disparity than team 1.

Look at these two sets of data:

a) 20, 37, 32, 39, 33, 34, 32, 28, 31, 29

b) **28, 33, 29, 31, 33, 27, 27, 30, 32, 27**

Without using a calculator, which set has the greater standard deviation?

Standard Deviations from the mean

Take the 1st set of data:

20, 37, 32, 39, 33, 34, 32, 28, 31, 29

MEAN = 31.5
STANDARD DEVIATION = 4.964876635 ≈ 5

What percent of the data lies within 2 standard deviations of the mean?

Standard Deviations from the mean

What percent of the data lies within 2 standard deviations of the mean?

MEAN = 31.5
2 Standard Deviations = 2 X 5 = 10

31.5 – 10 = 21.5
31.5 + 10 = 41.5

20, 37, 32, 39, 33, 34, 32, 28, 31, 29

What percent of the data is between 21.5 and 41.5 ?

Below is a list of the 25 longest rivers in the world.

River	Length (miles)
Nile	4,132
Amazon	3,976
Yangtze	3,917
Mississippi	3,902
Yenisei	3,445
Yellow River	3,395
Ob – Irtysh	3,364
Paraná - Río de la Plata	3,030
Congo	2,922
Amur	2,763
Lena	2,736
Mekong	2,705
Mackenzie	2,637
Niger	2,611
Murray	2,282
Tocantins	2,270
Volga	2,266
Shatt al-Arab – Euphrates	2,236
Madeira	2,100
Purus	1,995
Yukon	1,980
Indus	1,976
São Francisco	1,975
Syr Darya – Naryn	1,913
Salween	1,901

1) Complete the Five-Number Summary (the values which go on a box and whisker plot) for the data.

Smallest Value = _____ Lower Quartile = _____

Median = _____ Upper Quartile = _____

Largest Value = _____

2) Find the standard deviation and the mean of the data to the nearest tenth:

Standard Deviation = _____ Mean = _____

3) How many of the rivers are within 1 standard deviation of the mean? _____

4) What percent of the countries are within 1 standard deviation of the mean?_____

5) How many of the countries are within 2 standard deviations of the mean?_____

6) What percent of the countries are within 2 standard deviations of the mean?_____

7) If the five longest rivers are eliminated from the list, by how much does the mean decrease?

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Below is a list of the 25 longest rivers in the world.

River	Length (miles)
Nile	4,132
Amazon	3,976
Yangtze	3,917
Mississippi	3,902
Yenisei	3,445
Yellow River	3,395
Ob – Irtysh	3,364
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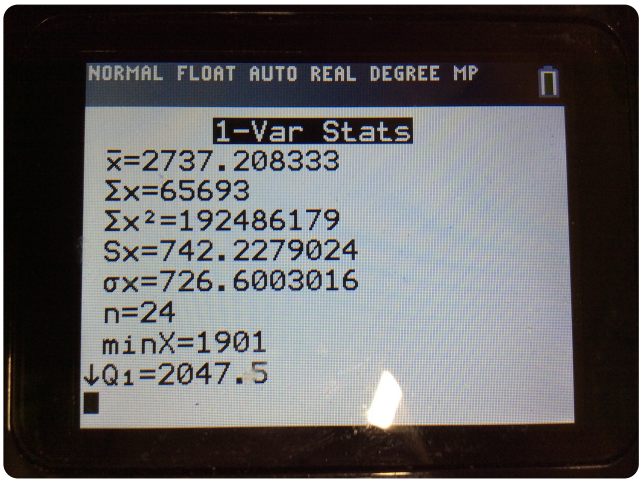
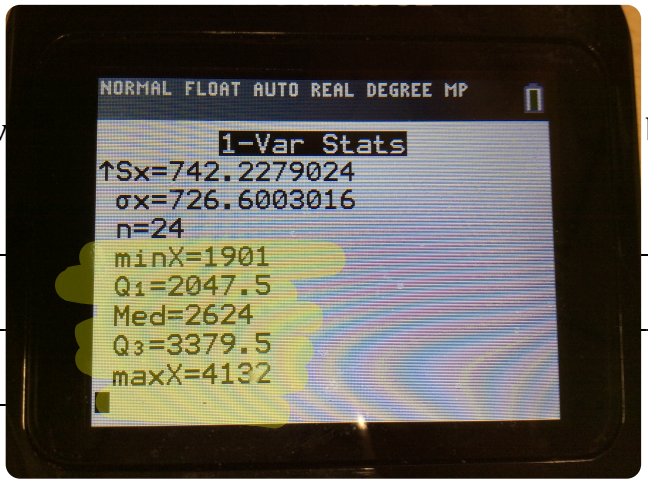


1) Complete the Fiv box and whisker plot) for the data.



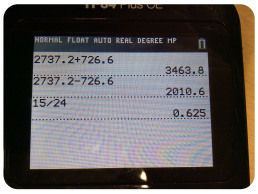
Smallest Value = _____

Median = _____

Largest Value = _____

2) Find the standard deviation and the mean of the data to the nearest tenth:

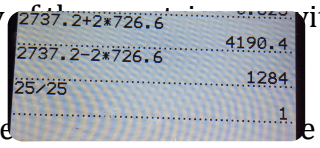
Standard Deviation = 726.6 Mean = 2737.2

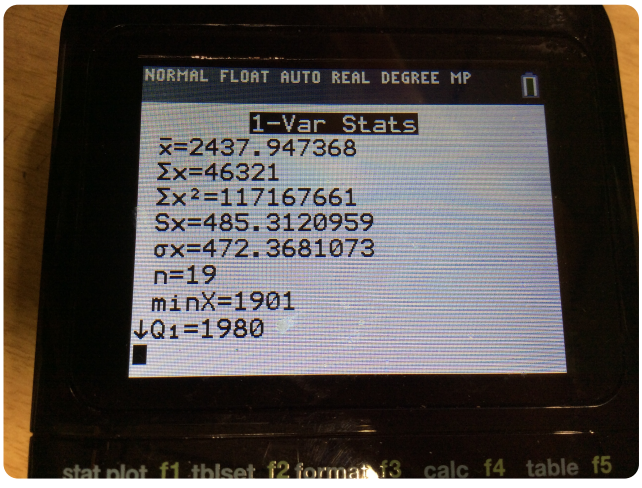
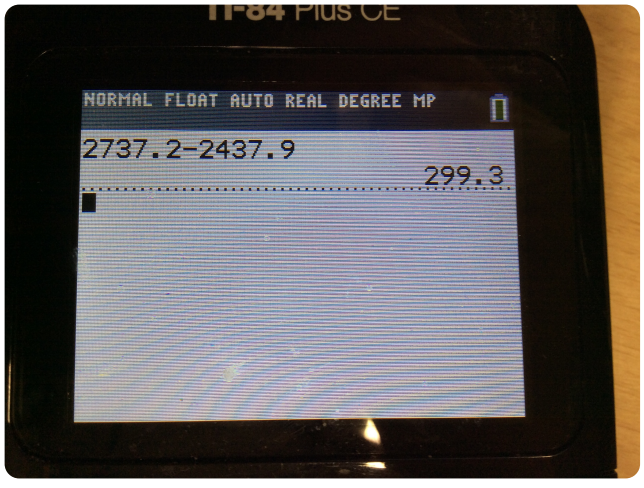


3) How many of the rivers are within 1 standard deviation of the mean? 15

4) What percent of the countries are within 1 standard deviation of the mean? 62.5%

5) How many of the rivers are within 2 standard deviations of the mean? 25



6) What percent of the rivers are within 2 standard deviations of the mean? 100%

7) If the five longest rivers are eliminated from the list, by how much does the mean decrease? 299.3