Let mw Know about HW Questions.

The test on the first Unit of Descriptive Statistics will be next **Tuesday, September 18th.** Starting Friday, you will be given review problems.

page 199... #3 should not have been assigned. :(Sorry

Warm Up from Algebra 2 - Solve for t

$30 \cdot (2.5)^t = 2000$

divide by 30

$2.5^t = \frac{2000}{30}$

$\log(2.5^t) = \log\left(\frac{2000}{30}\right)$

$t \cdot \log(2.5) = \log\left(\frac{2000}{30}\right)$

$t = \frac{\log\left(\frac{2000}{3}\right)}{\log(2.5)}$

≈ 4.58

Next

$$1800(2)^{-t} = 6$$

$$2^{-t} = \frac{6}{1800}$$

$$\frac{1}{2^t} = \frac{6}{1800}$$

$$6 \cdot 2^t = 1800$$

$$2^t = 300$$

$$\log(2^t) = \log(300) \qquad t = \frac{\log(300)}{\log(2)} \approx 8.23$$

$$1800(2)^{-t} = 6$$

$$\frac{1800}{2^t} = \frac{6}{1}$$

$$x^{-2} \longrightarrow \frac{1}{x^2}$$

HW
QUESTIONS

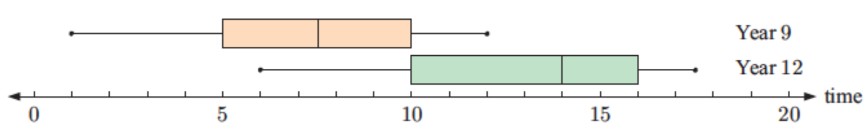
15 A sample of 10 measurements has a mean of 15.7 and a sample of 20 measurements has a mean of 14.3. Find the mean of all 30 measurements.

5 The table shows the sizes of land blocks on a suburban street.
Use technology to estimate the mean land block size.

Land size (m^2)	*Frequency*
[500, 600)	5
[600, 700)	11
[700, 800)	23
[800, 900)	14
[900, 1000)	9

EXERCISE 6G.2

1 The following side-by-side boxplots compare the times students in years 9 and 12 spend on homework.



a Copy and complete:

Statistic	*Year 9*	*Year 12*
minimum		
Q_1		
median		
Q_3		
maximum		

b For each group, determine the:
   i range **ii** interquartile range.

c Are the following true or false, or is there not enough information to tell?
   i On average, Year 12 students spend about twice as much time on homework as Year 9 students.
   ii Over 25% of Year 9 students spend less time on homework than all Year 12 students.

EXERCISE 6H

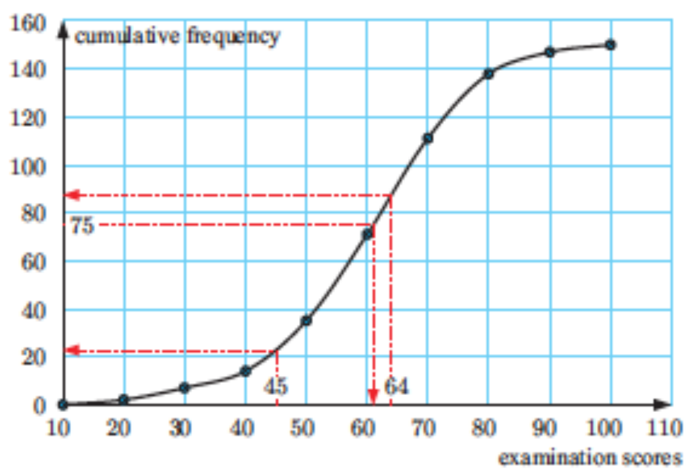
1 The examination scores of a group of students are shown in the table. Draw a cumulative frequency graph for the data and use it to find:

- a the median examination mark
- b how many students scored less than 65 marks
- c how many students scored between 50 and 70 marks
- d how many students failed, given that the pass mark was 45
- e the credit mark, given that the top 16% of students were awarded credits.

Score	*Frequency*
$10 \leqslant x < 20$	2
$20 \leqslant x < 30$	5
$30 \leqslant x < 40$	7
$40 \leqslant x < 50$	21
$50 \leqslant x < 60$	36
$60 \leqslant x < 70$	40
$70 \leqslant x < 80$	27
$80 \leqslant x < 90$	9
$90 \leqslant x < 100$	3

EXERCISE 6H

1

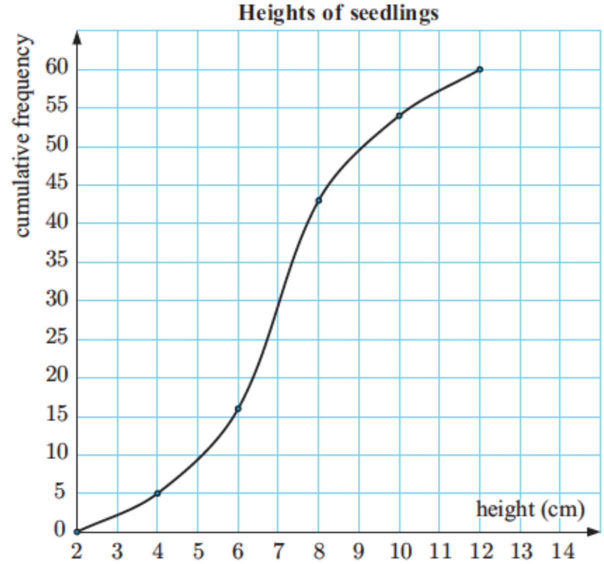


a $\approx$ 61 marks b $\approx$ 87 students c $\approx$ 76 students

d $\approx$ 23 students e 79 marks

2 A botanist has measured the heights of 60 seedlings and has presented her findings on the cumulative frequency graph below.

- **a** How many seedlings have heights of 5 cm or less?
- **b** What percentage of seedlings are taller than 8 cm?
- **c** Find the median height.
- **d** Find the interquartile range for the heights.
- **e** Copy and complete: "90% of the seedlings are shorter than ......"



See your LCQ

✓ Remain in class

✓ Each group given a copy of solutions

✓ NO cell phones

L_1

~~L_2~~

Heights of seniors - Table 1

Name	Height
Fred	6.0 ft.
George	5.8 ft.
Harry	5.9 ft.
Melvin	5.6 ft.
Vern	6.5 ft.
Dan	5.6 ft.
Andrew	5.8 ft.
Craig	5.8 ft.
Nate	5.9 ft.
Jeff	5.8 ft.

Mean = 5.87 feet

Standard deviation (or σ) = 0.254 feet

Heights of Seniors - Table 2

Name	Height
Mark	6.8 ft.
Matt	5.6 ft.
Lloyd	5.2 ft.
Jim	4.6 ft.
Cooper	7.1 ft.
Kirk	5.8 ft.
Charlie	5.7 ft.
Cleavon	5.9 ft.
Bob	5.6 ft.
Kenneth	6.1 ft.

Mean = 5.84 feet

Standard deviation (or σ) = 0.719 feet

Objectives:

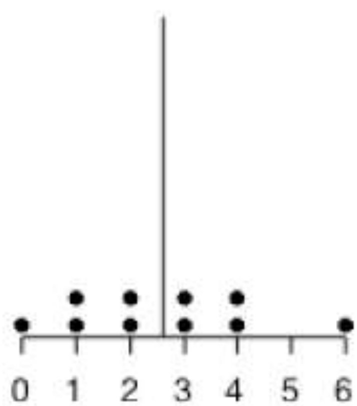
1. Understand what standard deviation means
2. Know how to calculate it by hand
3. Know how to calculate it with GDC

A

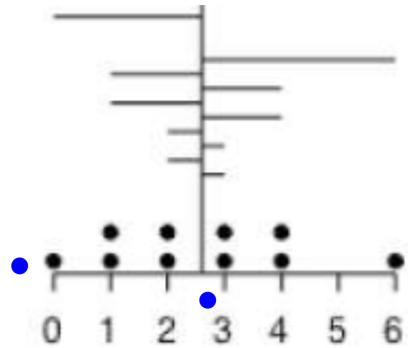
The
Standard Deviation
is a measure of how much variation there is from the center of the data.

actually from the mean.

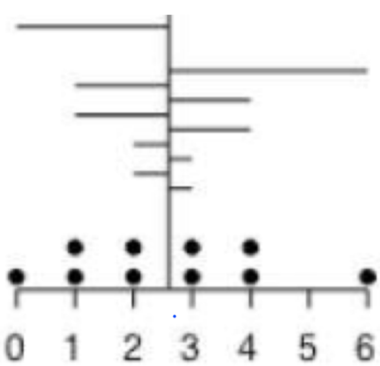
Watch

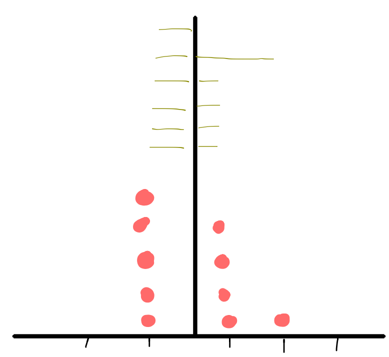


mean



Now, think about the average size (length) of all of those deviatio
estimate for the size of the Standard Deviation. Don't worry abou
deviation is to the left or right of the mean. Just consider all of the
length of the standard deviation below.

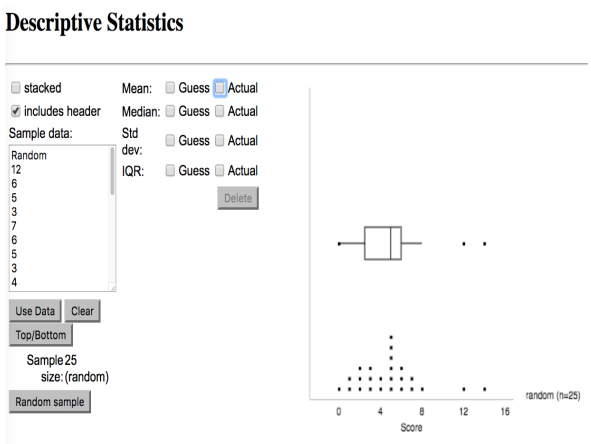


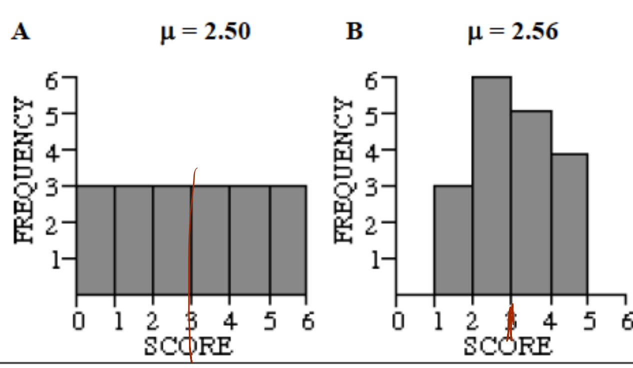


Larger Variability

Smaller Variability

Range
IQR
Standard Deviation

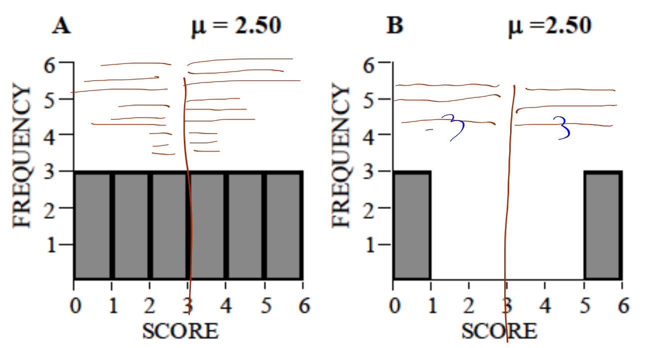




A has a larger standard deviation than B

B has a larger standard deviation than A

Both graphs have the same standard deviation



A has a larger standard deviation than B

B has a larger standard deviation than A

Both graphs have the same standard deviation

s =

s =

In your Ch. 6 Packet → Read the bottom half of page 197

$\bar{x} =$

$$S = \sqrt{\frac{\sum (x_i - \bar{x})^2}{n}}$$

hiccups^2

B

The Standard Deviation

is the square root

of the <u>average</u> of the squared deviations from the mean.

<u>Deviation</u> just means how far from the normal

$$(x_i - \bar{x})$$

each data value

mean

Together

Investion 4 on p.198

using two methods

$$s = \sqrt{\frac{\sum (x_i - \bar{x})^2}{n}}$$

x_1 x_2

School A 7 7 7 7 7

$\bar{x} = 7$ $n=5$

$$s = \sqrt{\frac{(7-7)^2+(7-7)^2+(7-7)^2+(7-7)^2}{5}} = 0$$

School B 5 6 7 8 9

$S_n =$ by table

School C 3 5 7 9 11

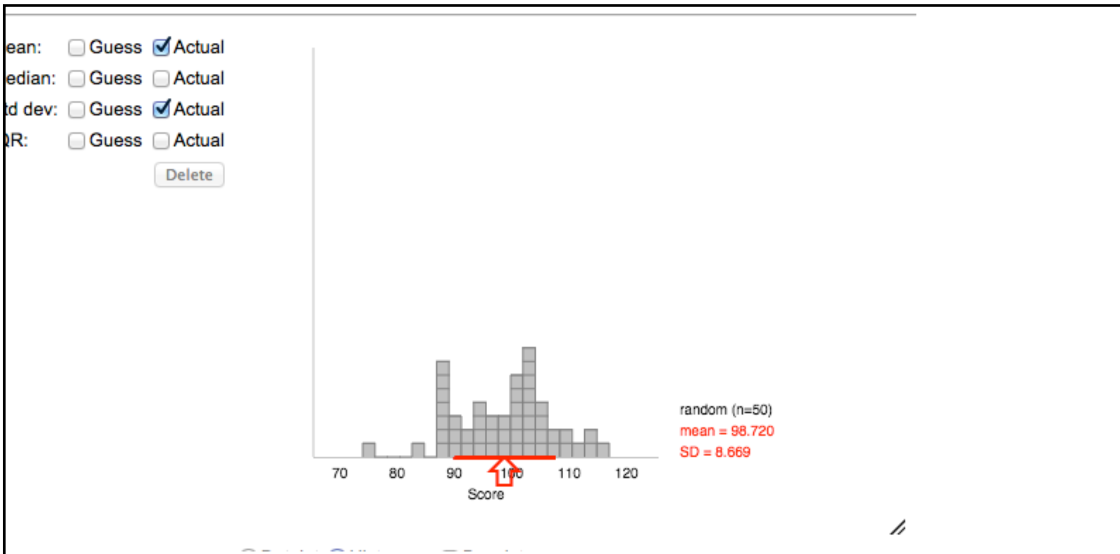
$\bar{x} = 7$ $n=5$

$$S = \sqrt{\frac{(3-7)^2+(5-7)^2+(7-7)^2+(9-7)^2+(11-7)^2}{5}}$$

$$= \sqrt{\frac{16+4+0+4+16}{5}} = \sqrt{\frac{40}{5}} = \sqrt{8}$$

≈ 2.83

1.1



The bigger the standard deviation, the more

variation in your data

The smaller the standard deviation,
the less variation in your data set.

J

Entire Population

μ = population mean

σ = population std. deviation

σ

Sample

$\bar{x}$ = mean of sample

s_n = Std deviation of sample

μ

Σ

Using GDC directly

enter school

c

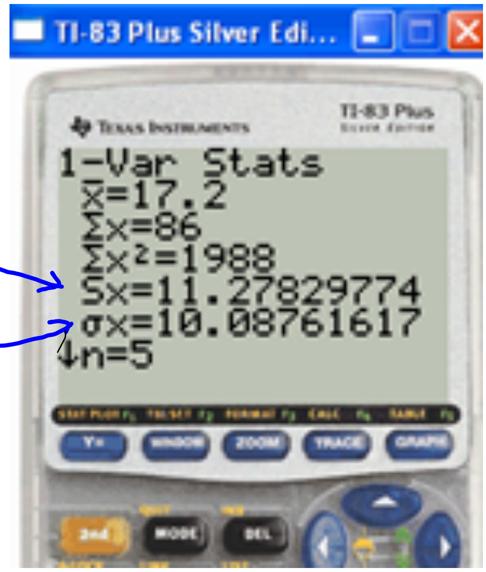
in List 1

3, 5, 7, 9, 11

Your GDC will calculate both versions of the standard deviation.

don't

Always for IB



Assignment --- Ch 6 HH packet

p.181.... 1
p.185.... 4
p.196....5, 6
p.199...3, 4, 6

The test on the first Unit of Descriptive Statistics will be next Tuesday, September 18th. Starting Friday, you will be given review problems.

Oh, yes. It's time for a Statistics Joke

Two statisticians were traveling in an airplane from LA to New York. About an hour into the flight, the pilot announced that they had lost an engine, but don't worry, there are three left. However, instead of 5 hours it would take 7 hours to get to New York.

A little later, he announced that a second engine failed, and they still had two left, but it would take 10 hours to get to New York.

Somewhat later, the pilot again came on the intercom and announced that a third engine had died. Never fear, he announced, because the plane could fly on a single engine. However, it would now take 18 hours to get to New York. At this point, one statistician turned to the other and said,

"Gee, I hope we don't lose another engine, or we'll be up here forever!"