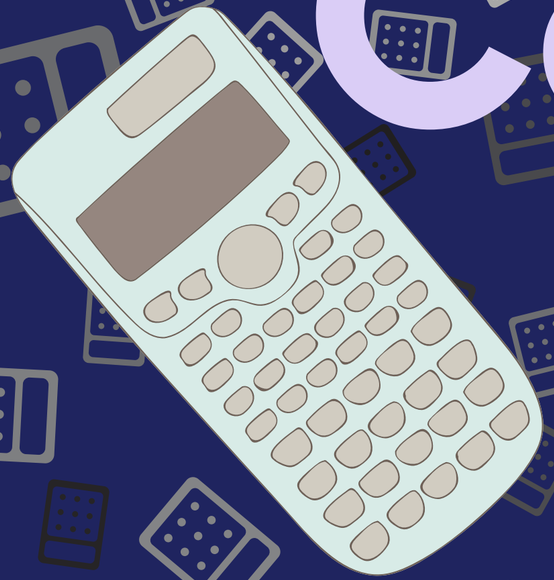
manipulating

Data in Calculator

BY
SUHAILI MUSA,
SITI HALIMAH BT BAKRI @ BAKORI
NORHISHAM AHMAT @ AHMAD



manipulating

Data in Calculator

BY
SUHAILI MUSA,
SITI HALIMAH BT BAKRI @ BAKORI
NORHISHAM AHMAT @ AHMAD

e ISBN 978-967-2777-28-1

e-ISBN: 9789672777281

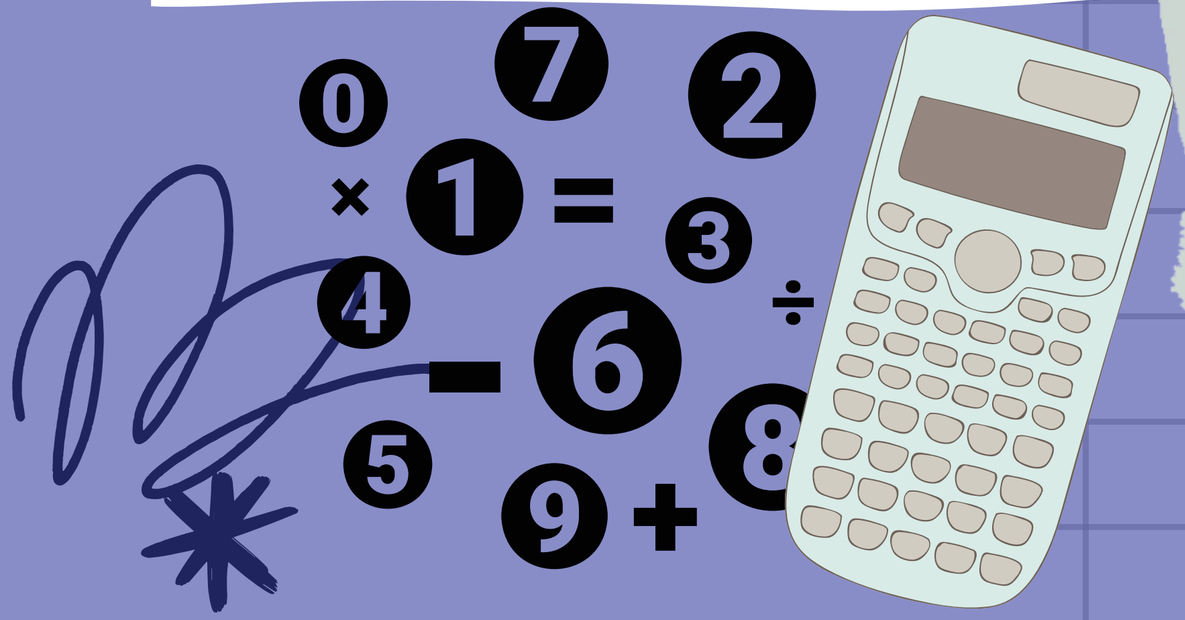
Published by
Kolej Poly-Tech MARA Batu Pahat,
Jalan Gading Emas 4, Sri Gading,
83300 Batu Pahat, Johor.

PREFACE

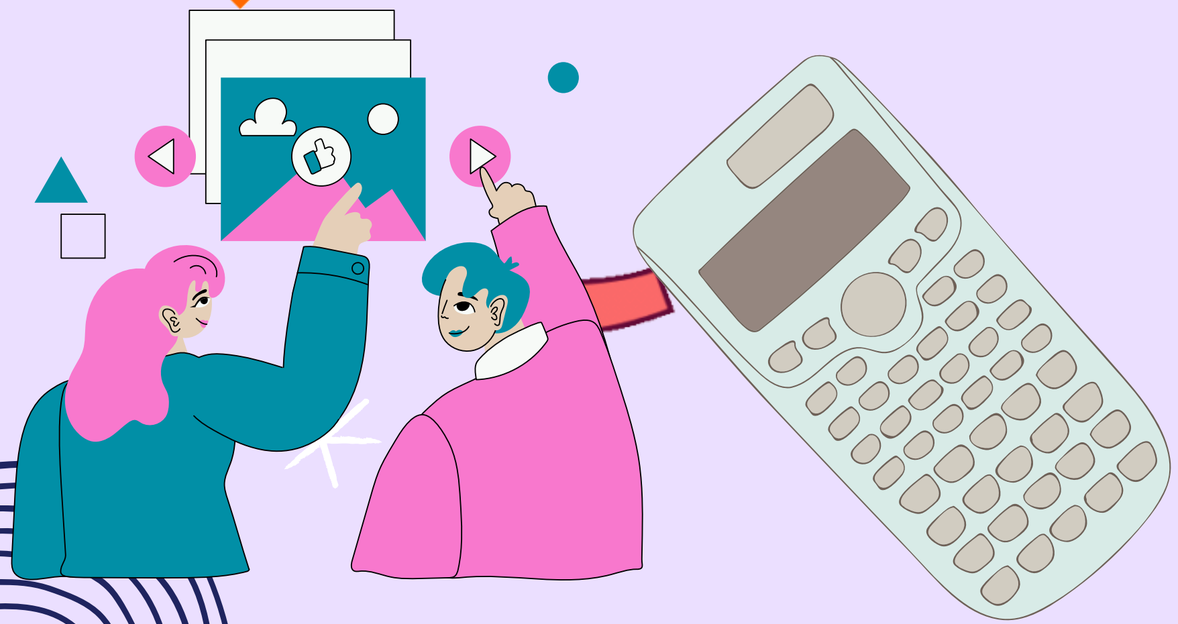
This e-book comprises 6 topics related to manipulating data on the calculator. The VINACAL VN-570 calculator(basic 570) is the primary reference in this e-book. The first topic will cover the basic settings of the calculator. Subsequently, the method for finding the area under the normal graph will be explained. The process of determining the mean, variance, and standard deviation for both grouped and ungrouped data will also be discussed. Next, the method for assessing the strength of correlation using the Pearson product-moment will be explored. Finally, the process of determining the regression line will also be discussed.

This e-book is extremely valuable for gaining essential skills in utilizing the calculator to handle statistical concepts related to the normal graph, measures of central tendency, correlation, and regression.

TABLE OF CONTENT



BASIC SETTING IN CALCULATOR

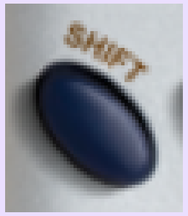


BASIC

Setting in calculator

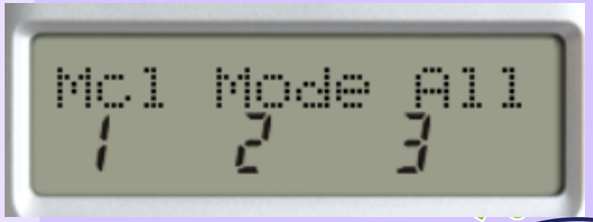
#1

Clear data and memory

1-Push button 

and 

2-Choose (1) to clear the memory of data in your calculator
(2) to clear mode in your calculator
(3) to clear memory and mode



3-After choosing the types of clear data that you want, don't forget to push the buttor 

4-Now, your calculator is ready for the next steps of calculation. It is recommended to perform this action each time you initiate to new calculation.

BASIC

Setting in calculator

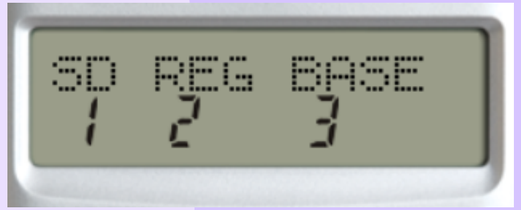
#2

Set the mode

1-Push button 

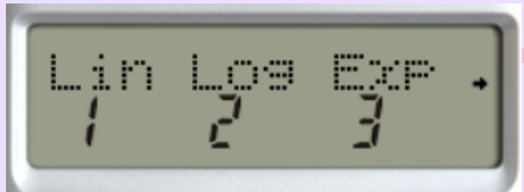
2X

2-Choose (1) for SD (standard deviation) mode
(2) for REG (regression mode)

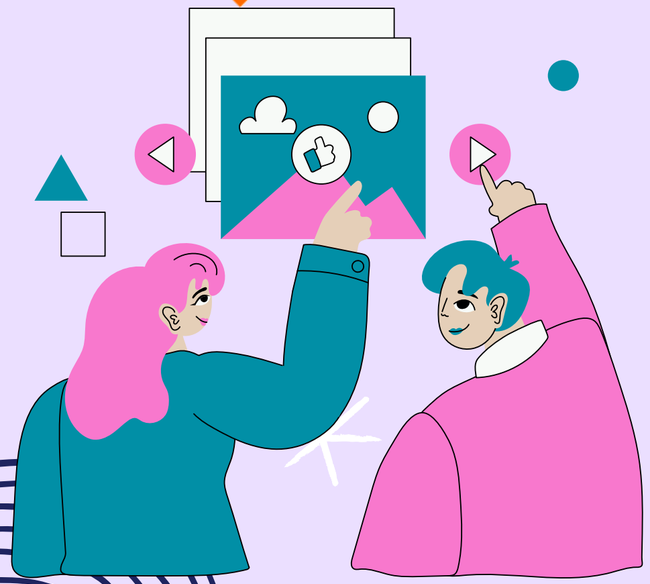


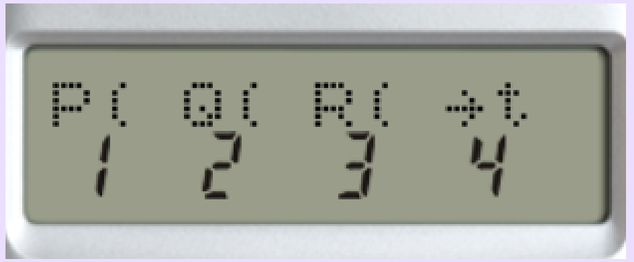
3-If you select option (1), the SD will be displayed on your calculator screen.

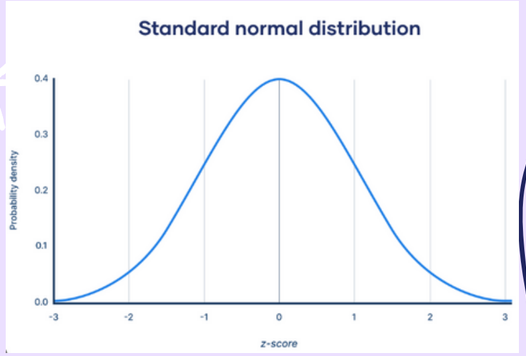
4-If you select option (2) for regression then you have to push button (1) for linear, since we are conducting the linear regression.



FINDING AREA OF NORMAL DISTRIBUTION CURVE





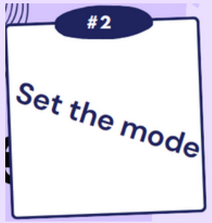


Finding the area of

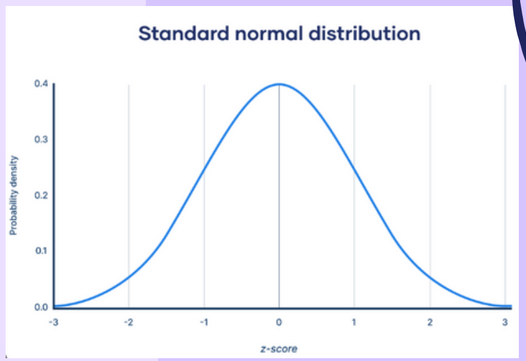
Normal Distribution

Z-test curve

1-Refer to Basic Setting calculator on setting mode.



2-Choose (1) for SD mode



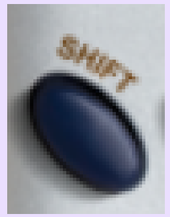
3-The SD will be displayed on your calculator screen

4-Your calculator is now prepared to calculate the area under the normal curve.

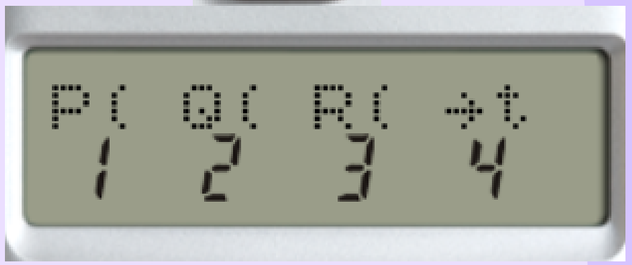
Finding the area of

Normal Distribution Z-test

curve

5-Push button 

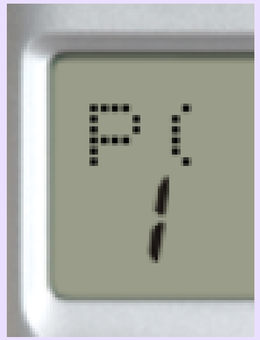
and choose button 

6-Then, your screen will appear as 

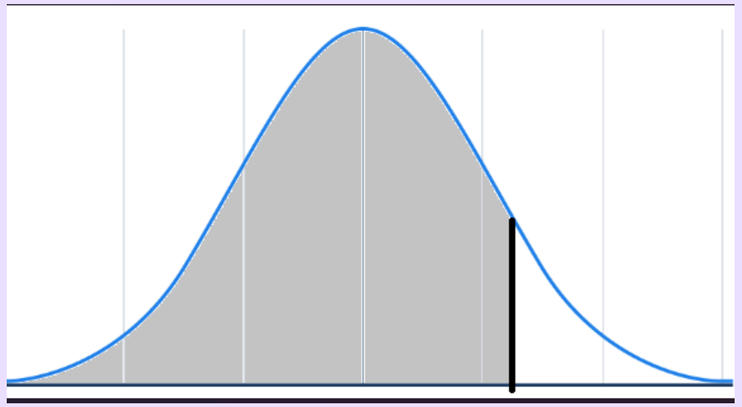
Now, we would like to explain the meaning of P (Q (and R (
(only these will represents the area under the bell curve for normal distribution)

Finding the area of Normal Distribution Z-test curve

If we choose



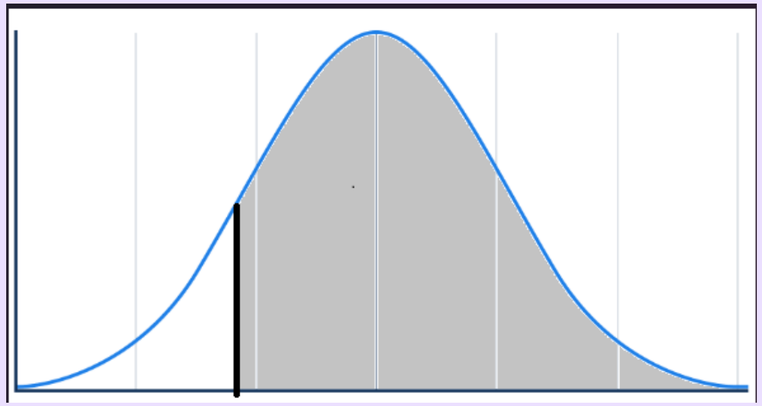
This means that we want to calculate the area under the bell curve to the left



Finding the area of Normal Distribution Z-test curve

If we choose

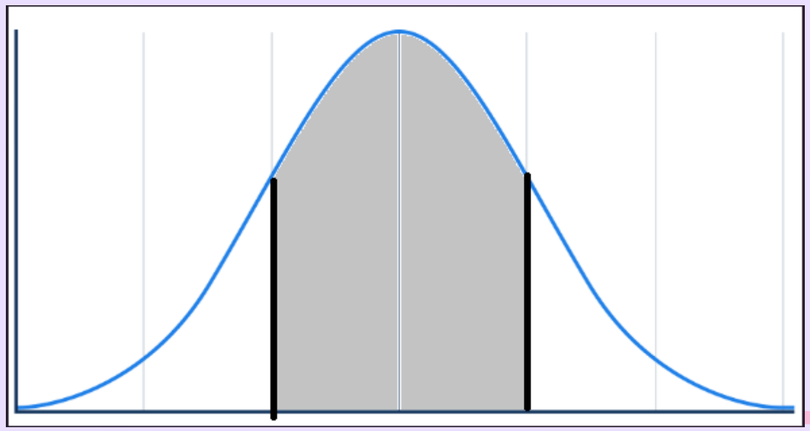
This means that we want to calculate the area under the bell curve to the right



Finding the area of Normal Distribution Z-test curve

and if we choose

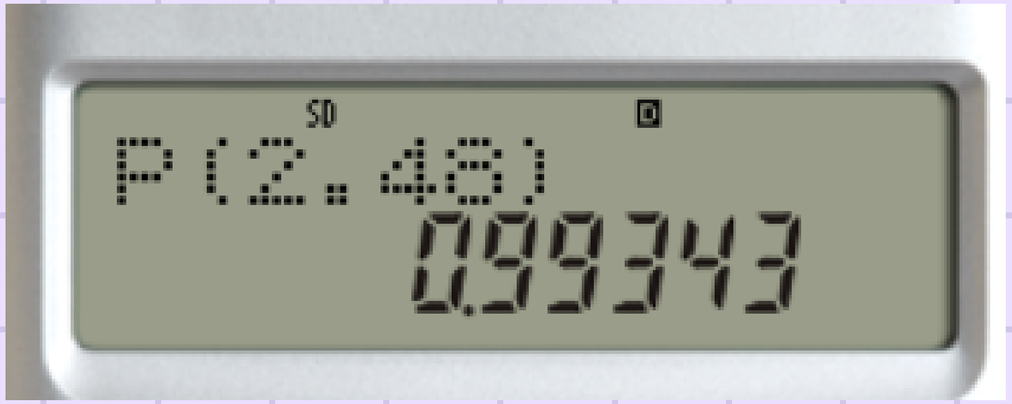
This means that we want to calculate the area under the middle bell curve



Let's try!

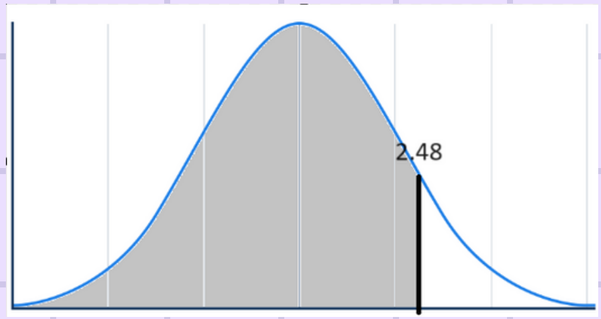
EXAMPLE 1.1

Find the area to the left of Z=2.48



Choose 1 for P (then just type the value of z inside the bracket), then push button 

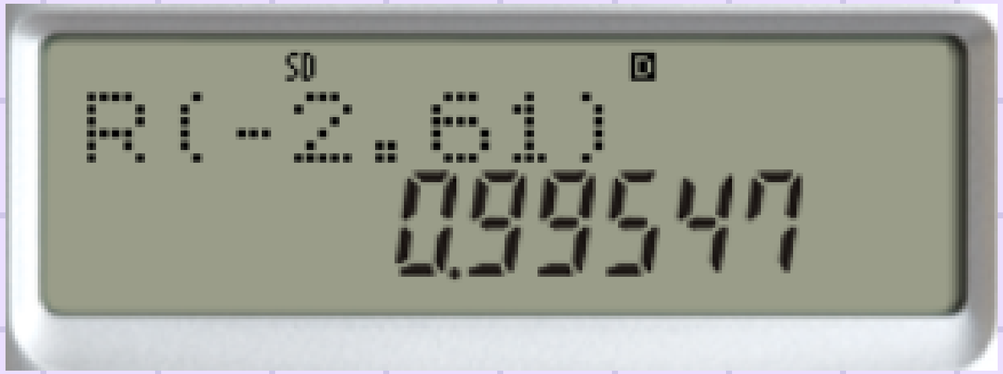
The value given is the area under the left side of bell curve as shown in a picture. The area represents 99.34%



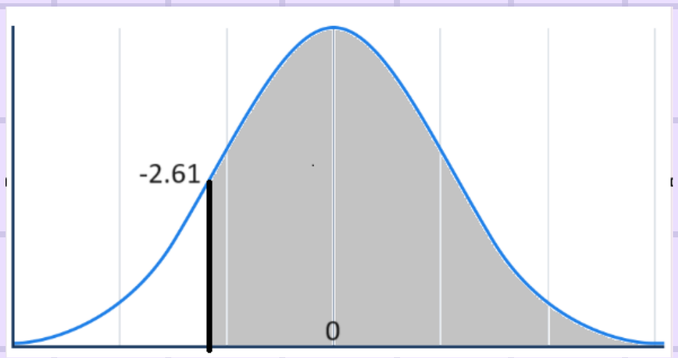
Let's try!

EXAMPLE 1.2

Find the P (Z>−2.61)



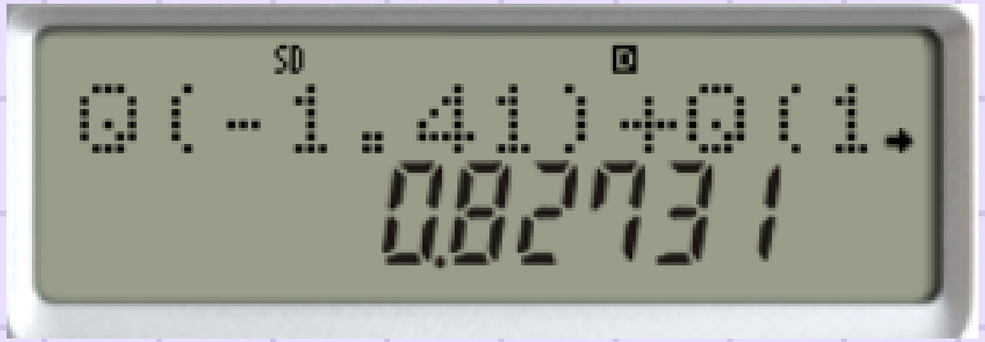
Choose 3 to represents R and we found that the probability for the area is given by 99.55% as shown in the bell curve picture



Let's try!

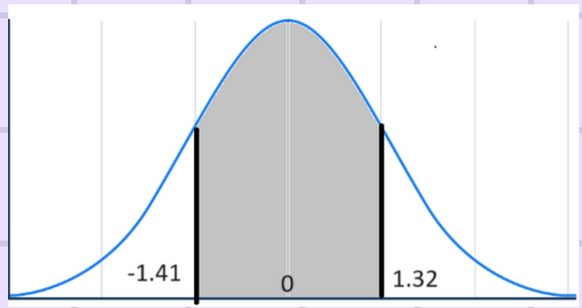
EXAMPLE 1.3

Find the area between Z=-1.41 and Z=1.32



This part is tricky, first after you choose 2 to represents Q then type the number for the left side that is Q(−1.41) and push button 

go back to step 5 and repeat to choose 2 again to represents Q (1.32)

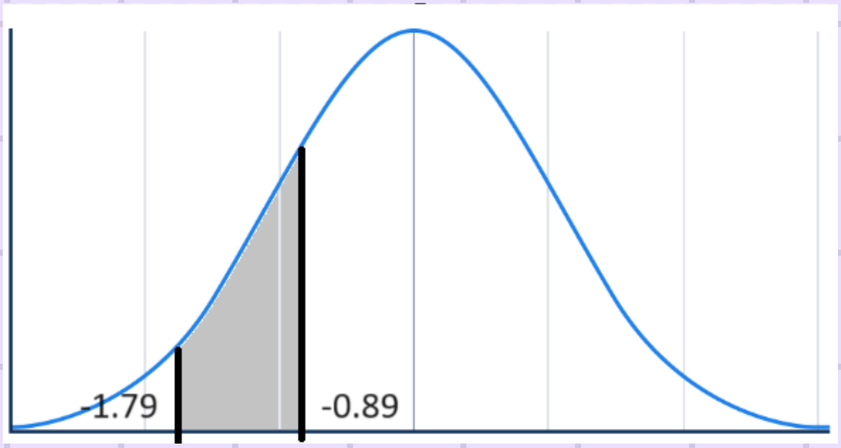


Bonanza!

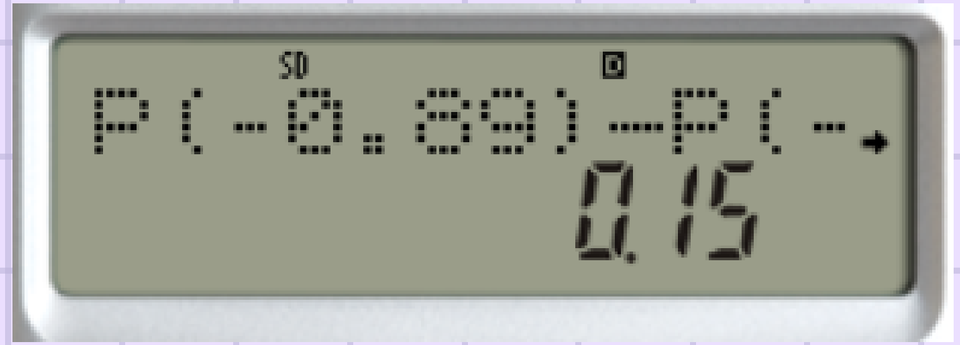
EXAMPLE 1.4

Find P(−1.79<Z<−0.89)

It’s look like the area will lies on left side of the bell curve, we can visualize as follow



Then we can improvise, you can choose P or Q in order to do that. P(−0.89)−P(−1.79)



Bonanza!

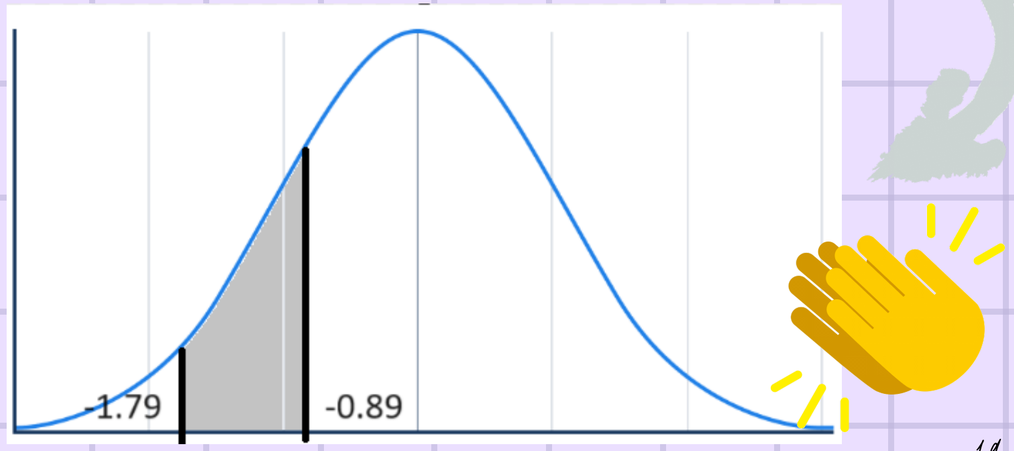
EXAMPLE 1.4

Find P(−1.79<Z<−0.89)

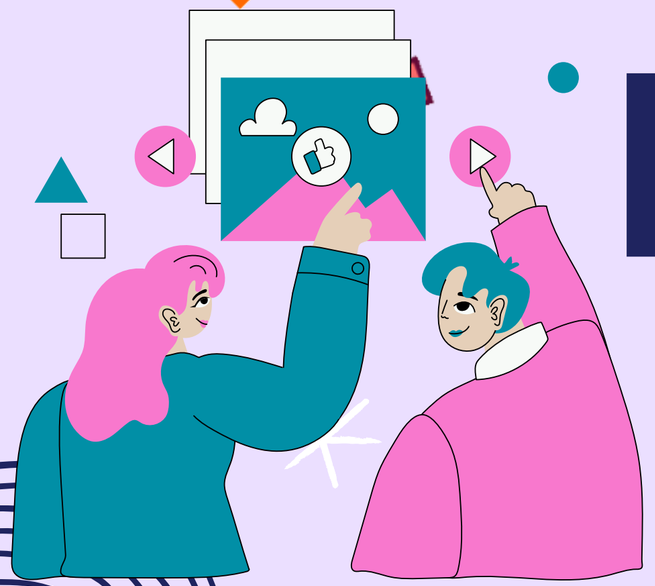
wonderful

Why we need to "−" (minus)??
The idea is like this

The big area of P(−0.89) and we want to get rid of small area of P(−1.79). The remaining area is what we want.



UNGROUPED DATA (MEAN, STANDARD DEVIATION,VARIANCE)



Ungrouped Data (mean, variance and s.d)

Normally, ungrouped data refers to data with a sample size of less than 30. We can utilize the calculator to compute the mean (average), variance, and standard deviation for a sample. Variance and standard deviation are useful when examining the spread of the data. A larger variance indicates more dispersed data. These measures are also employed to assess the consistency of the data.

Make sure your calculator is still in the mode SD

Ungrouped Data (mean, variance and s.d)

1-Choose (1) for SD mode

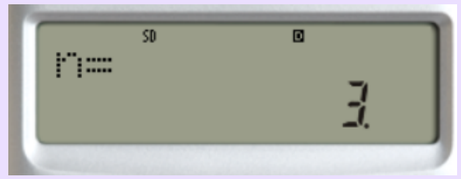
2-You will see the SD appears on your calculator screen

3-Now, your calculator will be ready to calculate the mean, variance and standard deviation for ungrouped data

Ungrouped Data (mean, variance and s.d)

4-This is how we want to key in the data.

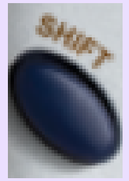
>>Type the **data** and push button 

5-Repeat the steps to key in all the data. Every time the data were key in, the screen would show you how many data entries you had. 

6-Make sure the data is synchronized with the total frequency data you insert.

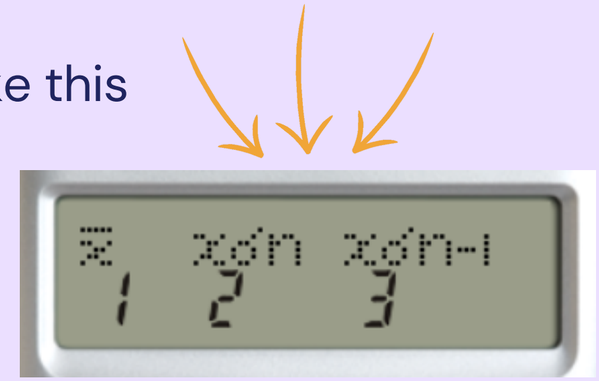
Ungrouped Data (mean, variance and s.d)

10-After key in all the data, your calculator already saves the data in their memory. Now, we would like to extract the mean from the data. Before doing this, don't forget to push the button 

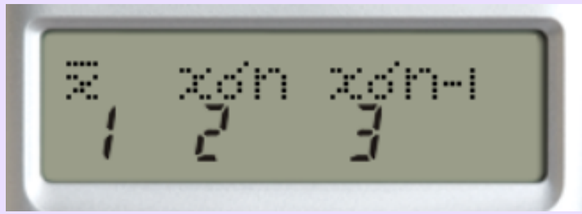
11-To extract the mean from data, push the button 

and then 

The screen will look like this



Ungrouped Data (mean, variance and s.d)



12-If you choose (1) we will get the mean (average) of the data
(2) we will get the standard deviation for the population
(3) we will get the standard deviation for a sample

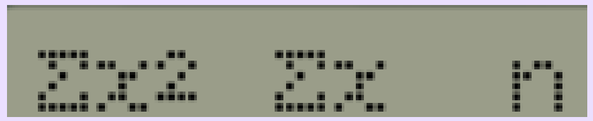
13- Don't forget to push button  in order to get the answer.

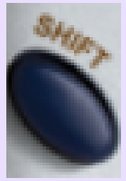
14-Repeat step 11 every time you want to recall back the information above.

15-To find the variance just square the answer for s.d, there go your answer.

Ungrouped Data (mean, variance and s.d)

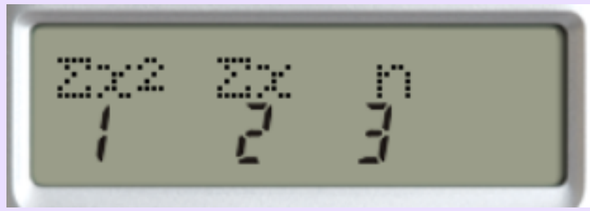
Some of us may need the value of



16-In this case you can push the button 

then 

Your screen will appear like this



There you go for the value listed there, don't forget to push button  every time you already choose which information you need.

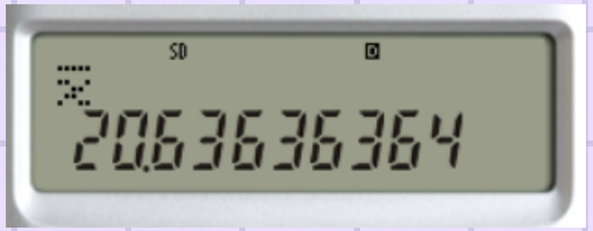
17-Repeat step 16 every time you want to recall back the information above

Let's try!

EXAMPLE 2.1

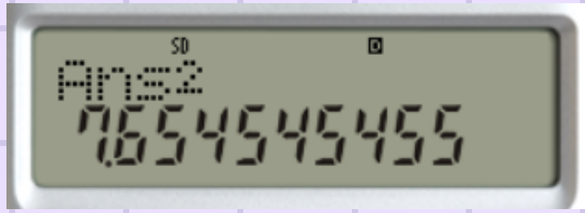
Find
mean, s.d and the variance
for the following sample data:
18,23,20,21,24,23,20,20,15,19,24

By using the steps mentioned earlier, we can find the mean



standard deviation

and the variance



GROUPED DATA (MEAN,STANDARD DEVIATION,VARIANCE)

Grouped Data (mean, variance and s.d)

For grouped data, where the dataset is more than 30, similar to ungrouped data, the calculator can provide the mean (average), variance, and standard deviation for both the sample and the population.

Once again, ensure that the calculator is set to SD mode.

Grouped Data (mean, variance and s.d)

1-Choose (1) for SD mode

2-You will see the SD appears on your calculator screen

3-Now, your calculator will be ready to calculate the mean, variance and standard deviation for grouped data. Grouped data will be in the frequency distribution table with interval and their frequency. The information we need to be key in the calculator are their midpoint and frequency.

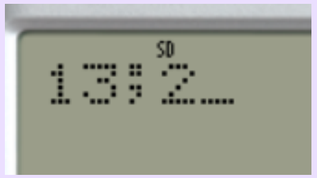
Grouped Data (mean, variance and s.d)

4-This is how we want to key in the data.

>>Type the **midpoint** then push the button 

then  followed by their

respective **frequency** then push the button 

Your screen will look like this 

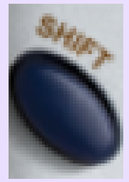
before you push button M+

Every time the button M+ was pushed, the screen would show the cumulative frequency of the data entered.

Repeat these steps until all the data are keyed in.

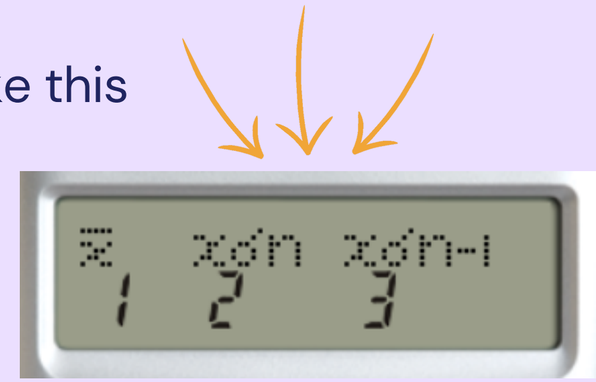
Grouped Data (mean, variance and s.d)

5-After key in all the data, your calculator already saves the data in their memory. Now, we would like to extract the mean from the data. Before doing this, don't forget to push the button 

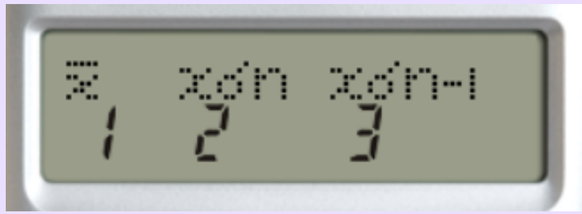
6-To extract the mean from data, push the button 

and then 

The screen will look like this



Grouped Data (mean, variance and s.d)



7-If you choose (1) we will get the mean (average) of the data
(2) we will get the standard deviation for a population
(3) we will get the standard deviation for a sample

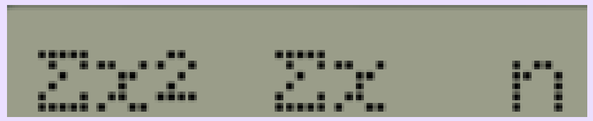
8-Don't forget to push button  in order to get the answer.

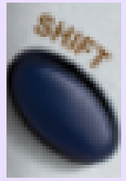
9-Repeat step 6 every time you want to recall back the information above.

10-To find the variance just square the answer for s.d, there go your answer.

Grouped Data (mean, variance and s.d)

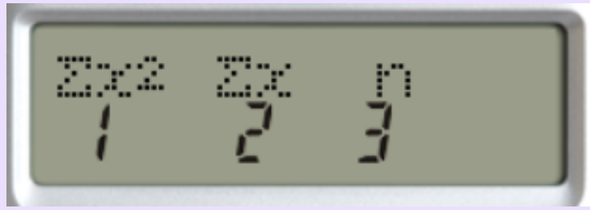
Some of us may need the value of



11-In this case you can push the button 

then 

Your screen will appear like this



There you go for the value listed there, don't forget to push button  every time you already choose which information you need.

12-Repeat step 11 every time you want to recall back the information above

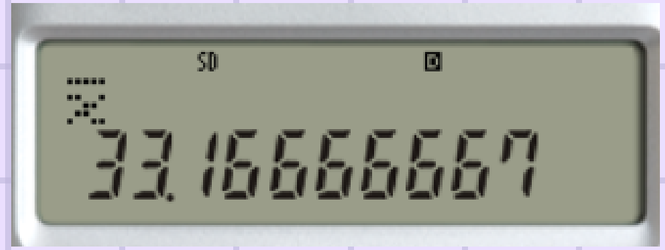
Let's try!

EXAMPLE 3.1

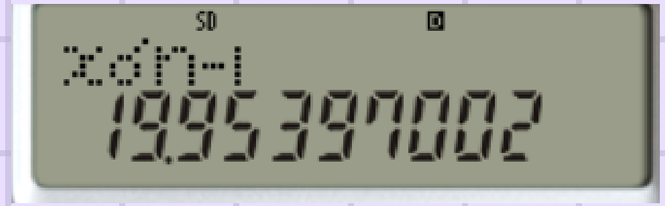
Find
mean, s.d and the variance
for the following sample data:

Midpoint x_i	*Frequency* f
4.5	5
14.5	3
24.5	5
34.5	**7**
44.5	2
54.5	4
64.5	4

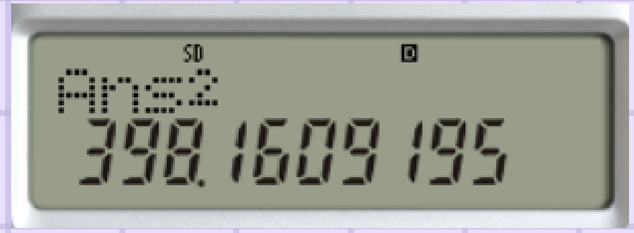
By using the steps mentioned earlier, we can find the mean



standard deviation



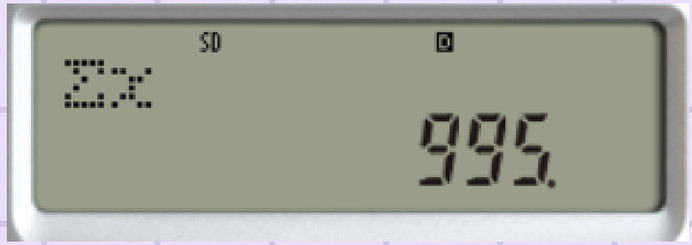
and the variance

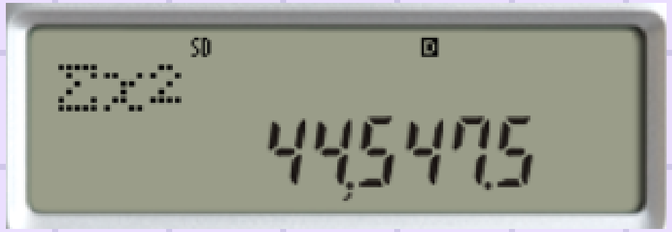


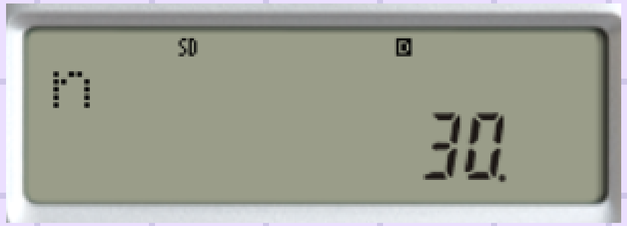
Checked!

Midpoint x_i	*Frequency* f
4.5	5
14.5	3
24.5	5
34.5	**7**
44.5	2
54.5	4
64.5	4

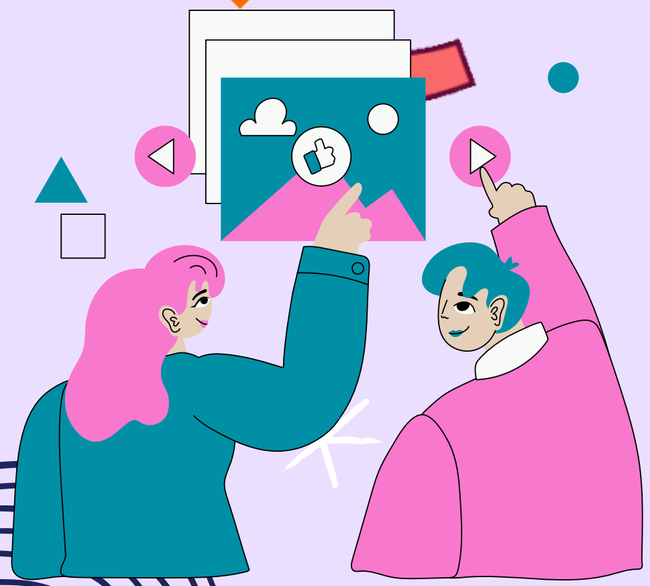
The following information are the summation that we get from our calculator, use the steps mentioned earlier to find these values.







PEARSON'S PRODUCT MOMENT COEFFICIENT



Pearson's Product Moment coefficient

2

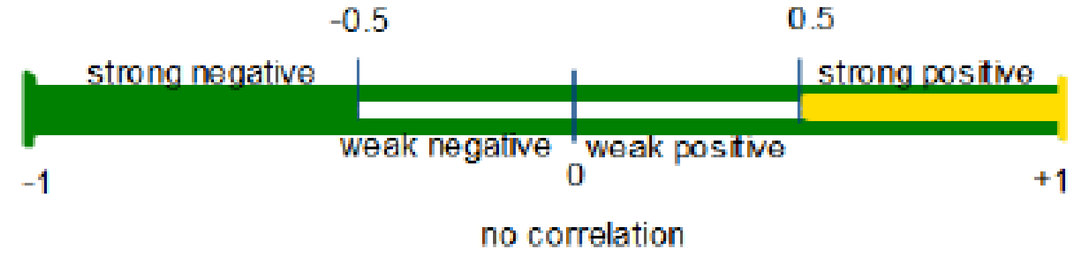
This method is to find the strength of the correlation between the associated two variables.

3

We denoted as "r"

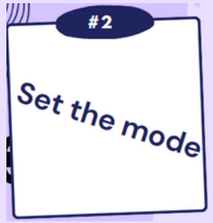
$$r = \frac{n(\sum xy) - (\sum x)(\sum y)}{\sqrt{\left[n(\sum x^2) - (\sum x)^2\right]\left[n(\sum y^2) - (\sum y)^2\right]}}$$

n = quantity of information
$\sum x$ = Total of all values for first variable
$\sum y$ = Total of all values for second variable
$\sum xy$ = Sum of product of first and second value
$\sum x^2$ = Sum of square of the first value
$\sum y^2$ = Sum of square of the second value

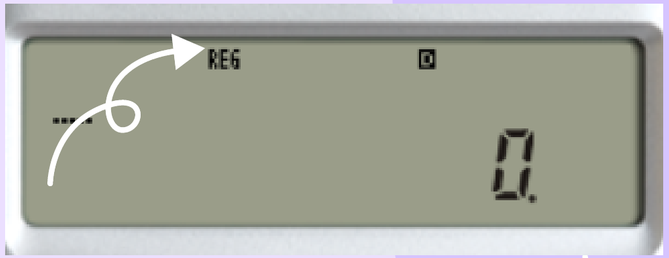


Pearson's Product Moment coefficient

1-Refer Basic Setting calculator on setting mode.



2-Make sure your screen shows REG mode

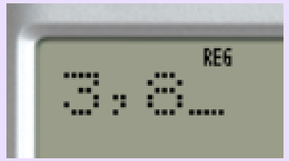


3-Now, your calculator will be ready to calculate the “r”. The information we need to key in the calculator are their respective variable “x” and “y”.

Pearson's Product Moment coefficient

4-This is how we want to key in the data.

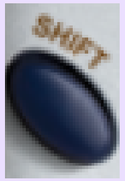
>>Type the **data "x"** and push button  followed by **data "y"** then 

the screen will look like this 

5-Repeat the steps to key in all the data. Every time the data were keyed in, the screen would show you how many data entries you had.

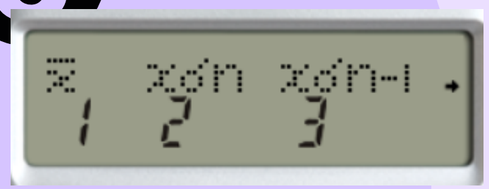
6-Make sure the data is synchronized with the total frequency data you insert.

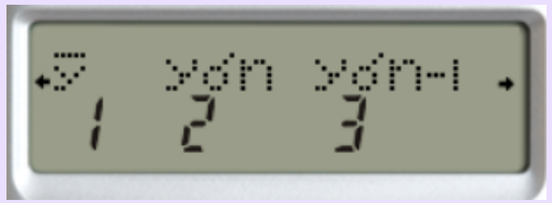
Pearson's Product Moment coefficient

7-To find “r” from data, push button 

and then 

The screen will look like this,



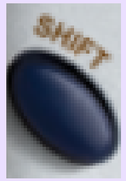




push “next” button until we find “r” (in this case number 3) and push the button 

There you go the answer of “r”

Pearson's Product Moment coefficient

Some of us may need the value of 

8-In this case you can push the button 

then 

Your screen will appear like this 


There you go for the value listed there, don't forget to push button 

every time you already choose which information you need.

9-Repeat step 8 every time you want to recall back the information above

Let's try!

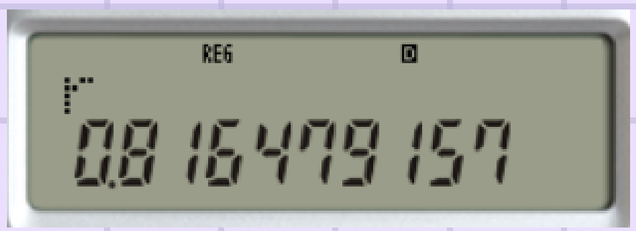
EXAMPLE 4.1

The following data gives the coursework mark (in %) and final examination mark (in %) for a sample of eight students in a statistics class.

Students	A	B	C	D	E	F	G	H
Coursework mark (CW)	78	67	75	62	56	77	72	50
Final exam mark (FE)	80	75	73	60	35	78	60	52

Compute and interpret the correlation coefficient for the above data.

By using the steps mentioned earlier, the coefficient relation "r" is



that means there is a **strong positive linear correlation** between coursework and final examination marks for a sample of eight students in statistics class.

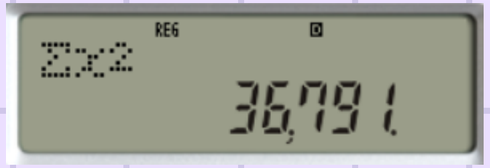
Checked!

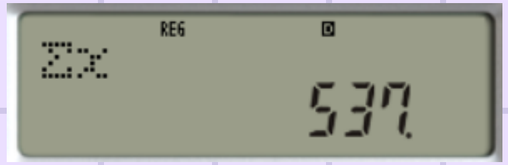
The following data gives the coursework mark (in %) and final examination mark (in %) for a sample of eight students in a statistics class.

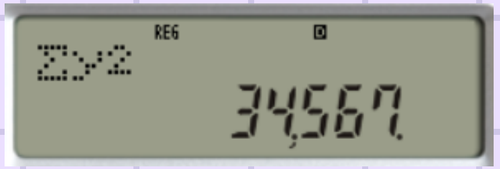
Students	A	B	C	D	E	F	G	H
Coursework mark (CW)	78	67	75	62	56	77	72	50
Final exam mark (FE)	80	75	73	60	35	78	60	52

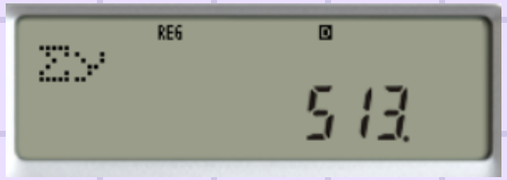
Compute and interpret the correlation coefficient for the above data.

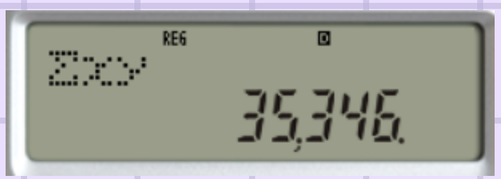
The following information are the summation that we get from our calculator, use the steps mentioned earlier to find these values.

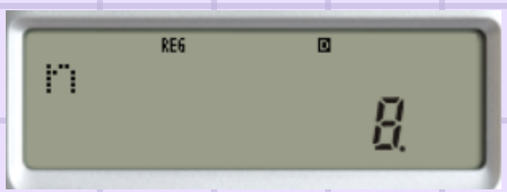




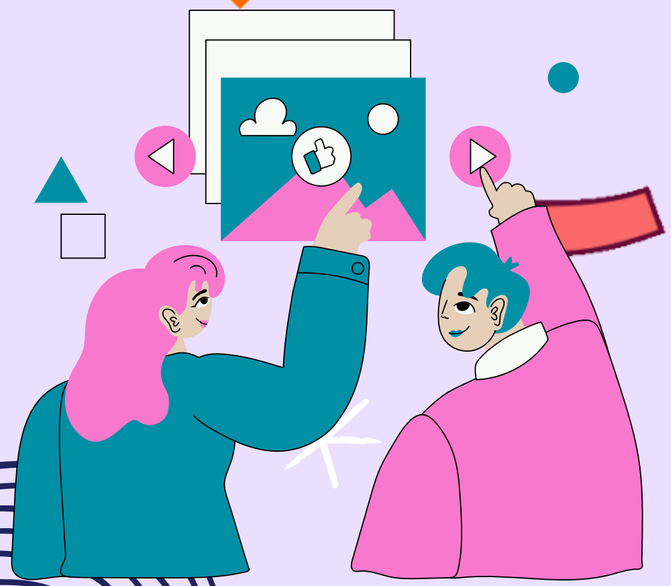








REGRESSION LINE



Regression Line

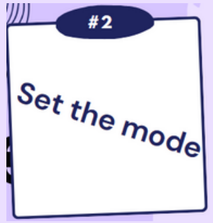
A regression line is a way to forecast the data. If we found that the correlation coefficient is significant for the variables “x” and “y”, the regression equation can be the best data line to fit the purpose. Here is the equation:

$$y = A + B\,x$$

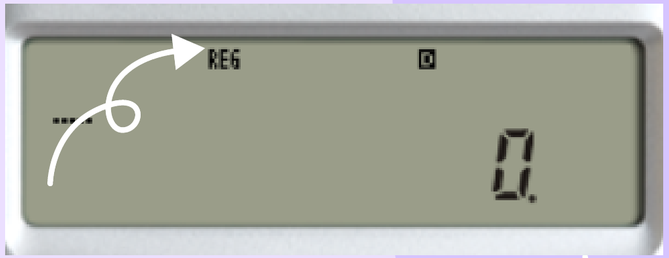
To perform this, make sure your calculator is in mode REG as before.

Regression Line

1-Refer Basic Setting calculator on setting mode.



2-Make sure your screen shows REG mode

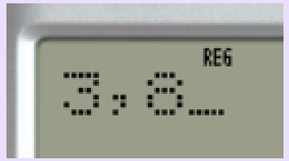


3-Now, your calculator will be ready to calculate the “A” and “B”. The information we need to key in the calculator are their respective variable “x” and “y”.

Regression Line

4-This is how we want to key in the data.

>>Type the **data "x"** and push button  followed by **data "y"** then 

the screen will look like this 

5-Repeat the steps to key in all the data. Every time the data were keyed in, the screen would show you how many data entries you had.

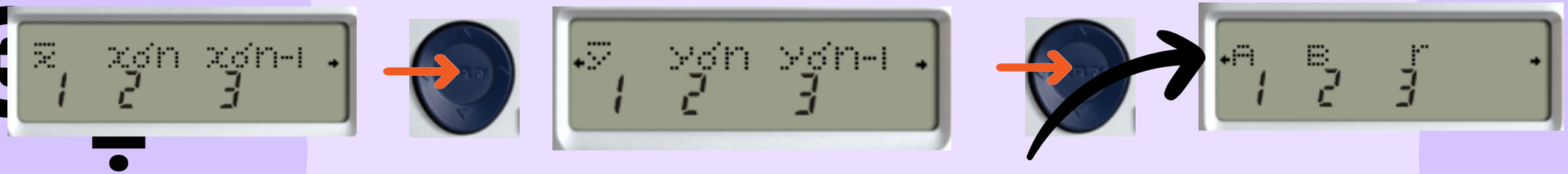
6-Make sure the data is synchronized with the total frequency data you insert.

Regression Line

7-To find “A” or “B” from data, push button 

and then 

The screen will look like this,



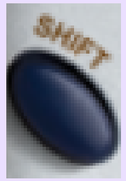
push “next” button until we find “A” (in this case number 1) or “B” (in this case number 2) and push button 

There you go the answer of “A” or “B”

8-Repeat the steps 7 every time you want to recall back the information above.

Regression Line

Some of us may need the value of

9-In this case you can push the button 

then 

Your screen will appear like this 


There you go for the value listed there, don't forget to push button 

every time you already choose which information you need.

10-Repeat step 9 every time you want to recall back the information above

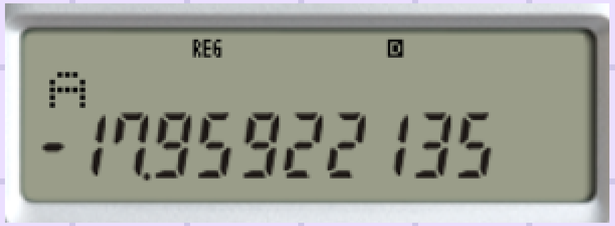
Let's try!

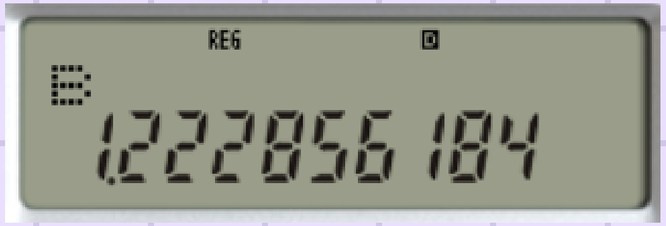
EXAMPLE 4.1

Find the linear regression equation of coursework mark and final examination mark of eight randomly selected students.

Students	A	B	C	D	E	F	G	H
Coursework mark (%)	78	67	75	62	56	77	72	50
Final exam mark (%)	80	75	73	60	35	78	60	52

By using the steps mentioned earlier, the values A and B are as follows:





Therefore the equation of the regression line is given by

$$y = -17.9592 + 1.2286x$$

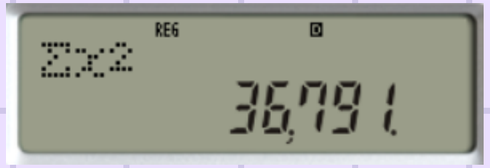
Checked!

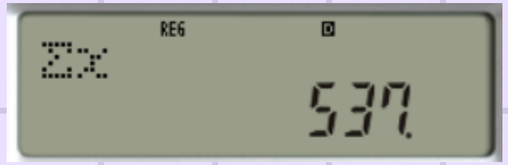
The following data gives the coursework mark (in %) and final examination mark (in %) for a sample of eight students in a statistics class.

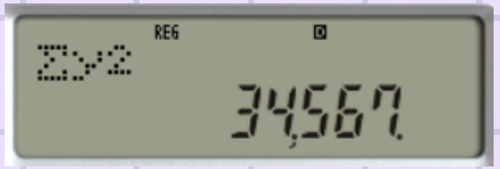
Students	A	B	C	D	E	F	G	H
Coursework mark (CW)	78	67	75	62	56	77	72	50
Final exam mark (FE)	80	75	73	60	35	78	60	52

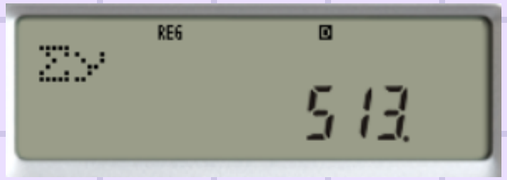
Compute and interpret the correlation coefficient for the above data.

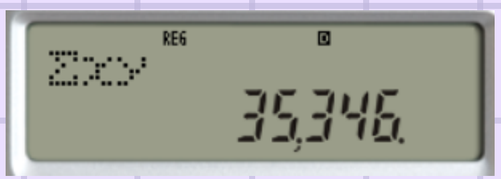
The following information are the summation that we get from our calculator, use the steps mentioned earlier to find these values.

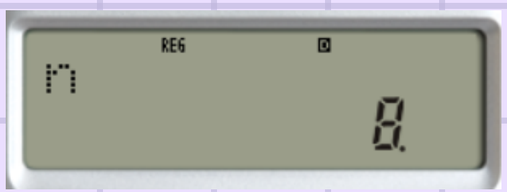












Maths is Like Going To Gym For Your Brain. It Sharpens Your Mind.

-Danica Mckellar

THANK YOU FOR PARTICIPATING