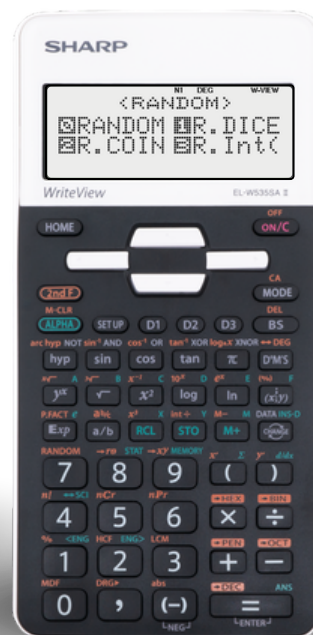
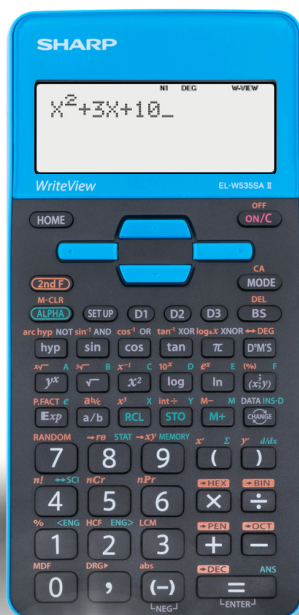


SHARP®

CALCULATORS

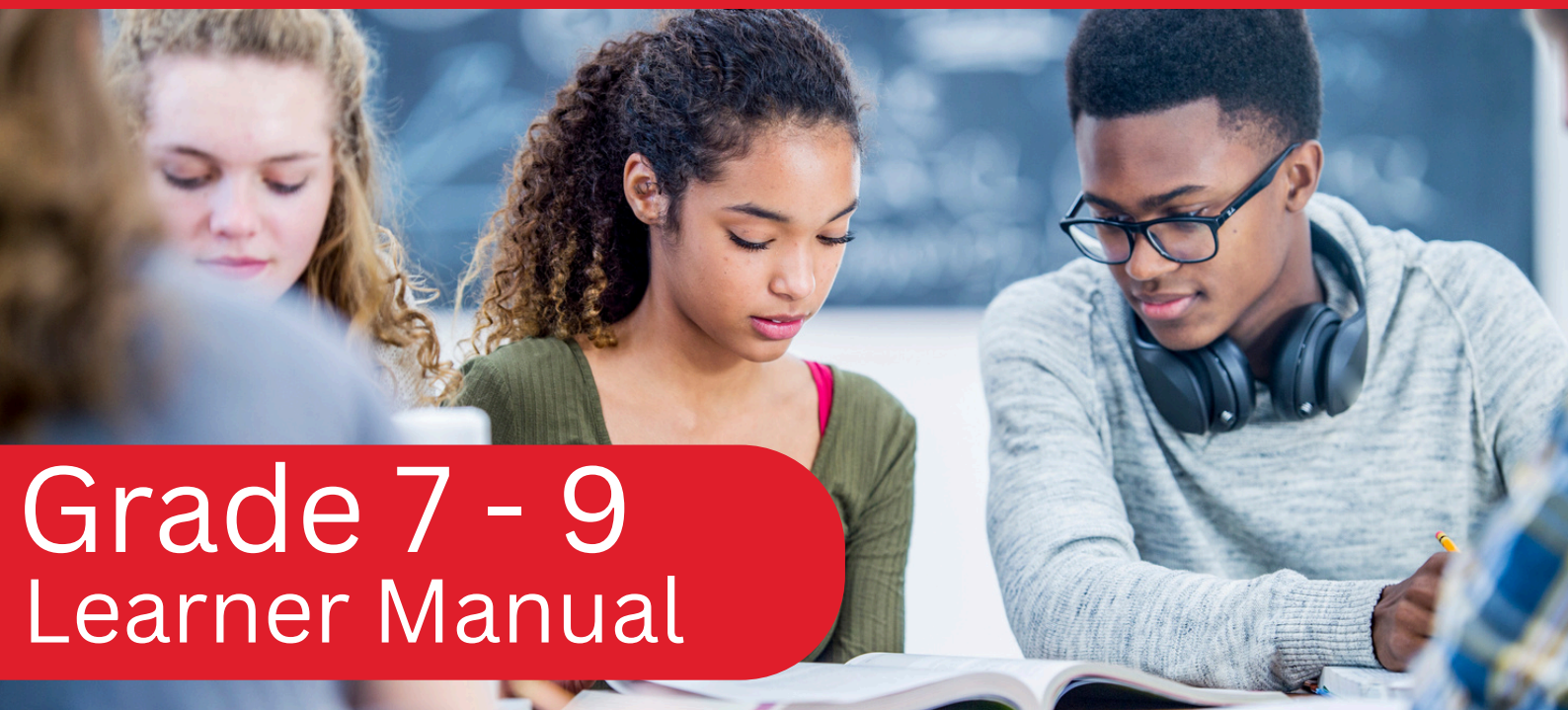


The new

EL-W535SA II

Scientific Calculator

Get Sharp • Be Sharp



Grade 7 - 9

Learner Manual

Index

About This Book: Page 3

Drill Mode:

Mental Math Practice Page 4

Normal Mode:

Highest Common Factor and Lowest Common Multiples Page 5

Fractions and decimals Page 6-7

Percentages Page 8-9

Exponents and Roots Page 10-11

Scientific Notation Page 12-13

Prime Factorisation Page 13

Number Patterns Page 14

Time conversions Page 15

Pythagoras Page 16

Experimental Probability Page 17

Ratio Mode: Page 18

Statistics Mode:

Single Data Page 19

Table Mode:

Straight Line Graphs Page 20

Solving Linear and Quadratic Equations Page 21-22

Finance Page 23-24

Transformation Geometry

Translations Page 25

Reflections Page 26

Rotations Page 27

About This Book:

“A tool is only useful when it’s the hands of someone who knows how to use it”
Andrew Naude

Do you know how to use all of the features of your Scientific Calculator?

If you answered no, then this book is perfect for you. You probably already have some knowledge of the features of your Scientific Calculator but you would like to learn more. In this book, we have taken math examples from Grade 7 up to Grade 9 and we show you how to answer them using the new Sharp EL-W535SAII Scientific Calculator.

The Sharp EL-W535SAII has 7 different mode settings. This book covers 6 of these modes (Differentiation mode is grade 12 math) with examples you can follow and step by step instructions on how to solve them on your Sharp EL-W535SAII calculator.

The contents of this book have been developed by experienced math teachers. As math teachers, we want to remind you that a calculator is designed to display the correct answer only, and that you can only be awarded full marks if you have shown all your calculations. The job of your calculator is to verify that your answer is correct, you still need to study hard in order to get a good result 😊



Sharp Calculators is invested in education. We don't just want you to have the best calculator, we want you to know how to use it to its full potential.

We offer free training to teachers across South Africa. In 2025 we trained over 2000 math teachers.

Our website: mathsatsharp.co.za is the largest website for free math content in South Africa. In 2025, our website reached over 900 000 page views, by May 2026 we reached over 1 million page views. You can download free worksheets and the fully worked out solutions for Grade 8 all the way to Grade 12.

We are the proud hosts of the Gauteng Math Olympiad.

The Sharp Math Competition started in 2026. We had over 20 000 participants in the first round.

Find us “maths at sharp” on:



YouTube



Drill Mode:

Mental Math

Your new Sharp EL-W535SAII has a built in drill mode. You can now practice your mental math anytime, anywhere. Lets take a look to see how this feature works:



Press: **CA MODE**

```

      N1 DEG W-VIEW
    <MODE> 1/2
  □NORMAL □STAT
  □TABLE □DRILL
  □DIFFERENTIATION
  
```

3

```

      N1 DEG W-VIEW
    <<DRILL>>
  □Math
  □Table
  (Multiplication)
  
```

0

```

  Math Drill
  Question? 25
  1 □ - × ÷ + - × ÷
  SELECT & [ENTER]
  
```

You can choose which math operation you want to practice (adding, subtracting, multiplication and division or all four operations) by pressing the arrow. You can also choose how many questions you want to practice by pushing the or arrow. You will then press the button. If you have put in the wrong answer and want to change it, press the button to clear it.

You can now start your mental math test. Read the question on the screen, put in the answer and press the equals button. Your calculator will mark each answer correct with a tick or if you get the answer wrong, it will mark it with a cross and let you try again. Once you have answered all the questions, your calculator will give you a total and a percentage. Have fun mental mathing 😊

```

  0 5/25
  ✓ 9- 9=0
  × 28÷ 4=8
  ✗ 28÷ 4=_
  
```

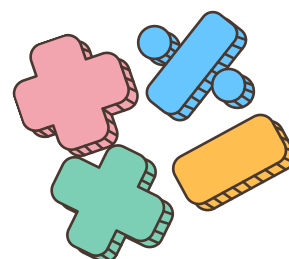


```

  Math Drill
  Question:25
  Type: + - × ÷
  ✓ : 22 ( 88%)
  
```

5 Reasons Why Mental Maths so important?

1. Builds a strong number sense.
2. Improves speed and confidence.
3. Strengthens problem solving skills.
4. Boosts focus and memory.
5. Improve calculator skills.



Find us "maths at sharp" on:



YouTube



Normal Mode:

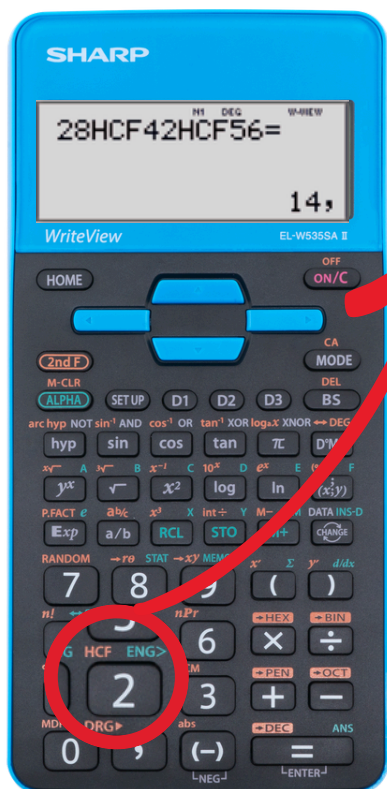
Highest Common Factor and Lowest Common Multiple

You can find the HCF or LCM of two or more numbers on your Sharp EL-W535SAII calculator. Lets see how this works:

Highest Common Factor (HCF):

Lets say that you want to calculate the HCF of: 28; 42 and 56.

Press: $\boxed{2}\boxed{8}\boxed{\text{2ndF}}\boxed{2}\boxed{4}\boxed{2}\boxed{\text{2ndF}}\boxed{2}\boxed{5}\boxed{6}\boxed{=}$

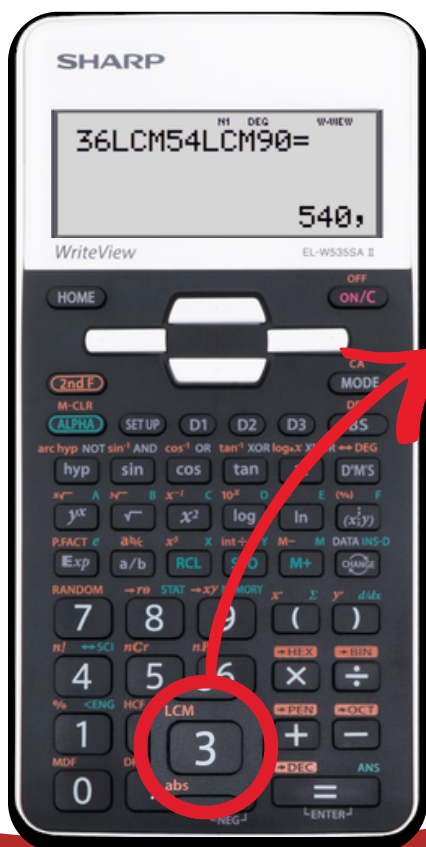


!! We encourage you to check your answers using the HCF and LCM feature. Remember, marks are awarded for showing your calculations.

Lowest Common Multiple (LCM):

Lets say that you want to calculate the LCM of: 36;54 and 90.

Press: $\boxed{3}\boxed{6}\boxed{\text{2ndF}}\boxed{3}\boxed{5}\boxed{4}\boxed{\text{2ndF}}\boxed{3}\boxed{9}\boxed{0}\boxed{=}$



Find us "maths at sharp" on:



YouTube



Normal Mode:

Fractions and Decimals

Converting an improper fraction to a mixed fraction:

Example:

$\frac{22}{7}$ into a mixed number

Press: $\boxed{2} \boxed{2} \boxed{\frac{a}{b}} \boxed{7} \boxed{=}$



Converting a mixed fraction to an improper fraction:

Example:

$5\frac{3}{4}$ into an improper fraction

Press: $\boxed{5} \boxed{2nd F} \boxed{\frac{a}{b}} \boxed{3} \boxed{\frac{\square}{\square}} \boxed{4} \boxed{=}$



Converting from a fraction to a decimal or decimal to a fraction:

If you want to convert from a fraction to a decimal or from a decimal to a fraction, simply enter in that value, press the equals button and then the



Find us "maths at sharp" on:

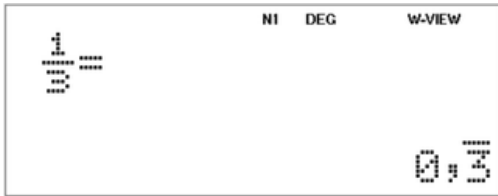


YouTube

Normal Mode:

Recurring Decimals

Your Sharp EL-W535SAII calculator can represent a recurring decimal with a bar over the repeated digits.



Representing a fraction as a recurring decimal.

Example:

Represent $\frac{68}{99}$ as a recurring decimal

Press: **SETUP** **▼** **5** **1**

Press: **6** **8** **a/b** **9** **9** **=** **DATA INS-D**



Representing a recurring decimal as a fraction:

Example:

Represent $0,2\overline{5}$ as a fraction

Press:

0 **,** **2** **5** **2** **5** **2** **5** **2** **5** **2** **5** **2** **5** **2** **5** **2** **5** **2** **5** **=**



Find us "maths at sharp" on:



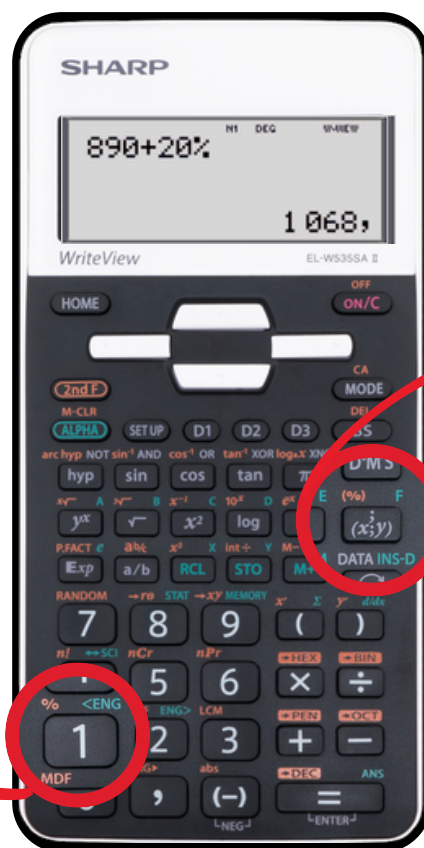
YouTube



Normal Mode:

Percentages:

Percentage increase and decrease shortcut



2nd F **(%)**

Regular percentage button

Expresses value out of 100 in simplest form.

Please do not confuse the two different percentage buttons. They do not have the same function. !!

Percentage increase and decrease shortcut:

Example: (percentage increase)

A pair of running shoes increased by 20%. The original price was R890,00. Calculate the new price.

Press: **8** **9** **0** **+** **2** **0** **2nd F** **1**

Example: (percentage decrease)

A PS5 costs R18 999. It is discounted by 35%, calculate the new price.

Press: **1** **8** **9** **9** **9** **-** **3** **5** **2nd F** **1** **CHANGE** **CHANGE**



Find us "maths at sharp" on:



YouTube



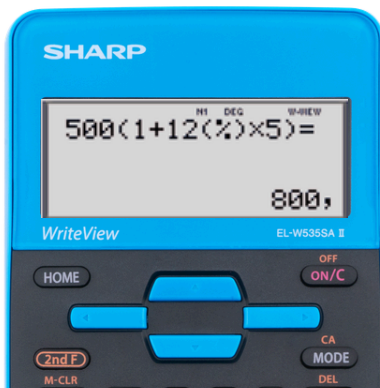
Normal Mode:

Percentages:

Example:

R500 is invested at 12% simple interest for 5 years. Calculate the value of the investment after 5 years:

Press: $500(1+12\%\times 5)=$



Calculating marks as a percentage- Shortcut

Example:

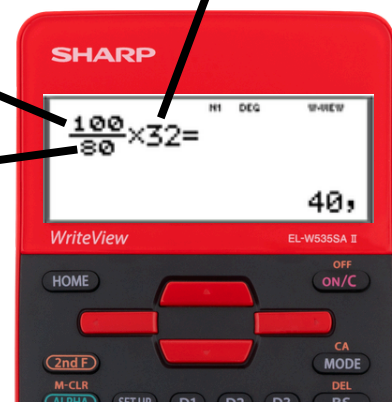
Students recieved the following marks out of 80 for a class test: 32,48,71, 56, 44, 25 and 52. Calculate their percentages.

Press: $100 \div 80 \times 32 =$

The new value that you want to convert the mark to
(In the example we want a percentage so we convert the value to 100)

The mark the test was out of

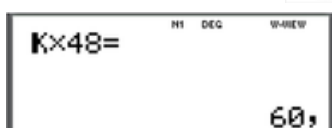
Learners mark



Now for the shortcut:

(Only enter in the next mark and equals. Repeat this for each mark.)

Press: $48 =$



Find us "maths at sharp" on:



YouTube



Normal Mode:

Exponents and Roots

Testing Laws of Exponents

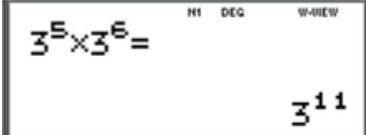
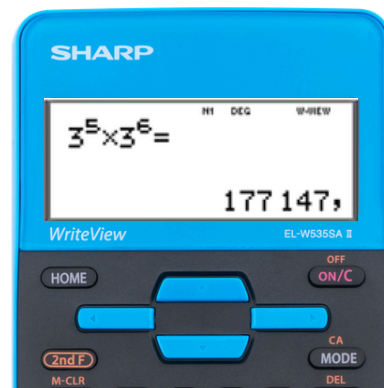
Examples
Simplify

a) $3^5 \times 3^6$

Press: $\boxed{3} \boxed{y^x} \boxed{5} \boxed{\rightarrow} \boxed{\times} \boxed{3} \boxed{y^x} \boxed{6} \boxed{=}$

To convert this value into exponential form:

Press: $\boxed{2ndF} \boxed{Exp}$

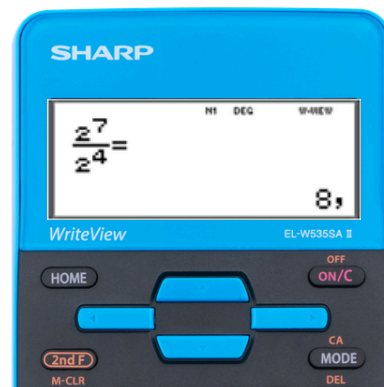
b) $\frac{2^7}{2^4}$

Press: $\boxed{2} \boxed{y^x} \boxed{7} \boxed{\rightarrow} \boxed{a/b} \boxed{2} \boxed{y^x} \boxed{4} \boxed{=}$

To convert this value into exponential form:

Press: $\boxed{2ndF} \boxed{Exp}$



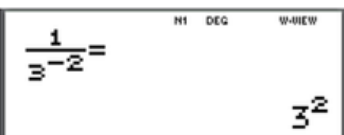
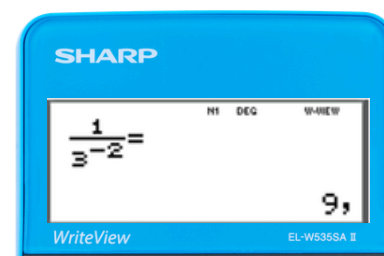


c) $\frac{1}{3^{-2}}$

Press: $\boxed{1} \boxed{a/b} \boxed{3} \boxed{y^x} \boxed{-} \boxed{2} \boxed{=}$

To convert this value into exponential form:

Press: $\boxed{2ndF} \boxed{Exp}$

Find us "maths at sharp" on:



YouTube



Normal Mode:

Exponents and Roots

Square roots and Cube roots

Examples

Simplify

a) $\sqrt{36}$

Press: $\sqrt{}$ 3 6 =



b) $\sqrt[3]{64}$

Press: 2ndF $\sqrt[3]{}$ 6 4 =



c) $\sqrt[3]{-27}$

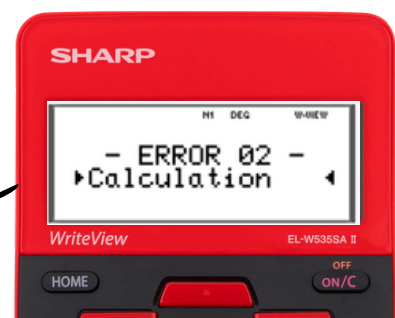
Press: 2ndF $\sqrt[3]{}$ (-) 2 7 =



d) $\sqrt{-4}$

Press: $\sqrt{}$ (-) 4 =

The square root of any negative number is non-real and therefore the calculator displays error 2.



Find us "maths at sharp" on:



YouTube

Normal Mode:

Scientific Notation

Your calculator can display a value in scientific notation and take a value in scientific notation and display it in standard notation.

Examples

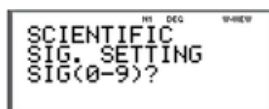
Write the following value into scientific notation:

- a) The distance from Earth to Mars is approximately $2500000000\text{km}'s$ away

Press: **SETUP** **1**



Press: **1**



In this example there are 2 significant values:

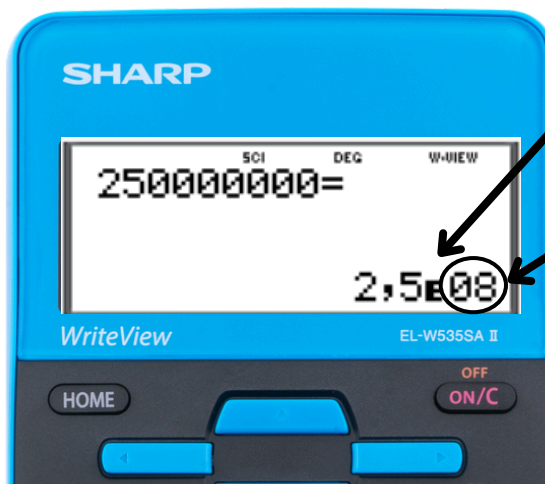
Press: **2**



Put the large number from the question into the calculator:



Press: **=**



"E" represents $\times 10$

8 is the
exponent
value

Find us "maths at sharp" on:



YouTube

Normal Mode:

Scientific Notation

Converting From Scientific notation to Standard notation:

Example:

Convert $1,258 \times 10^8$ to standard notation.

Press: 1 , 2 5 8 P.FACT $\frac{\circ}{\circ}$ Exp 8



Did you know?

The Earth is approximately $1,496 \times 10^{11}$ meters away from the sun.

To put that distance into perspective, it would take you about 4000 years to walk that distance.



Prime Factorisation

Taking a large number and displaying it as a product of its prime factors:

Example:

Write down 450 as a product of its prime factors:

Press:

4 5 0 $\frac{\circ}{\circ}$ DEG ANS $\frac{\circ}{\circ}$ ENTER 2nd F P.FACT $\frac{\circ}{\circ}$ Exp



Find us "maths at sharp" on:



YouTube

Normal Mode:

Number Patterns:

Linear Number Patterns - A Constant Difference

Example:

The following number pattern is given:

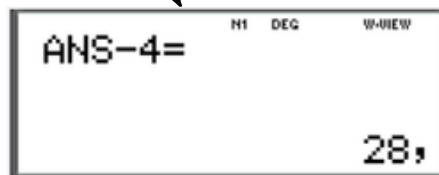
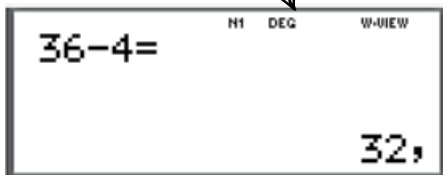
36; 32; 28; 24 ...

- Determine the next three numbers in the pattern.
- Write down the general formula that represents this pattern.
- What is the value of the 100th term?
- Which term has the value of

$\overset{-4}{\curvearrowright}$
 $\overset{-4}{\curvearrowright}$
 $\overset{-4}{\curvearrowright}$
 36; 32; 28; 24 ...

We are subtracting 4 each time to get the next value: The constant difference is -4

Press:



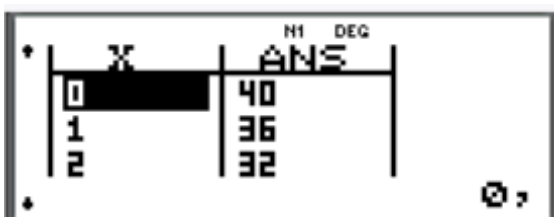
Every time you press the “=” button, the calculator produces the next number in that sequence.

The constant difference $\downarrow$
 The term value before The first term $\downarrow$

$$T_n = -4n + 40$$

You can now put this equation into your calculator in table mode and check your solutions:

Press: **CA** **MODE** **2** **-** **4** **2ndF** **RCL** **+** **4** **0** **=** **=** **=** **=**



Press:



to view the next number in the sequence and verify that your equation is correct.

Find us “maths at sharp” on:



YouTube

Normal Mode:

Time Conversions

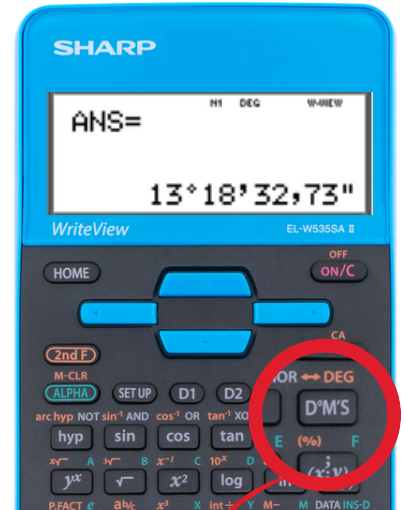
Your calculator can convert to Hours, Minutes and Seconds

Example:

A truck drives from Johannesburg to Durban at an average speed of 55km/h. The distance he travels is 732km's. Calculate how long the trip took him. Give your answer in hours and minutes and seconds.

Press: $\boxed{7}\boxed{3}\boxed{2}\boxed{\div}\boxed{5}\boxed{5}\boxed{=}$ $\boxed{2ndF}$ $\boxed{D^{\circ}M^{\circ}S}$

Answer: 13hours, 18 minutes and 33 seconds.



Degrees; Minutes and Seconds

Example:

Thandeka is a chef, and works the following shifts:

Monday: 9 hrs and 12 minutes

Tuesday: 8 hrs and 26 minutes

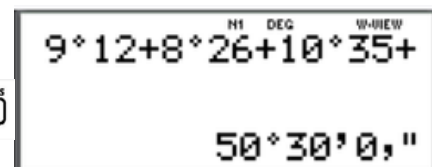
Wednesday: 10hrs and 35 minutes

Thursday: 9hrs and 10 minutes

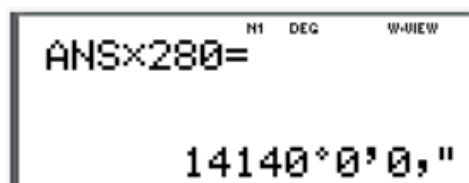
Friday: 13 hrs and 7 minutes

If she gets paid R280,00 per hour, how much was she paid for the week? (Monday - Friday)

Press: $\boxed{9}\boxed{D^{\circ}M^{\circ}S}\boxed{+}\boxed{8}\boxed{D^{\circ}M^{\circ}S}\boxed{+}\boxed{10}\boxed{D^{\circ}M^{\circ}S}\boxed{+}\dots\boxed{=}$



Press: $\boxed{\times}\boxed{2}\boxed{8}\boxed{0}\boxed{=}$



Answer: Thandeka earns R14140,00 for the week.

Find us "maths at sharp" on:



YouTube

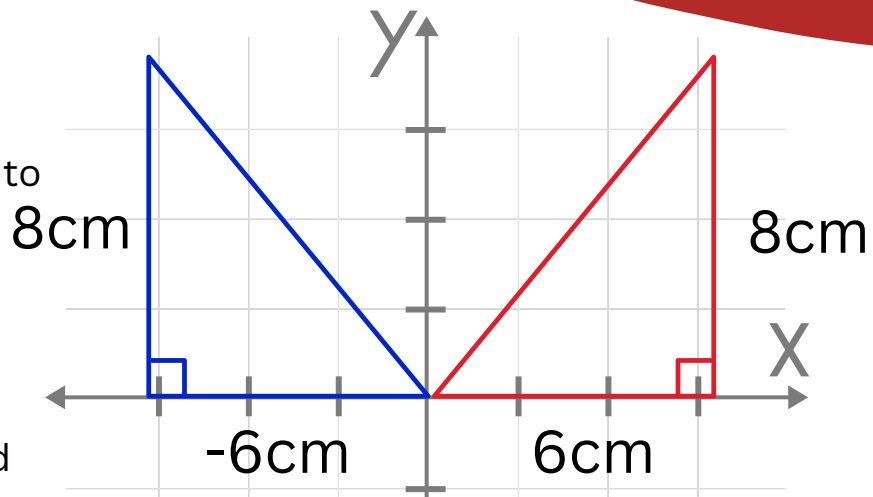
Normal Mode:

Pythagoras

Your calculator has a built in Pythagoras button and can be used to calculate the length of the hypotenuse.

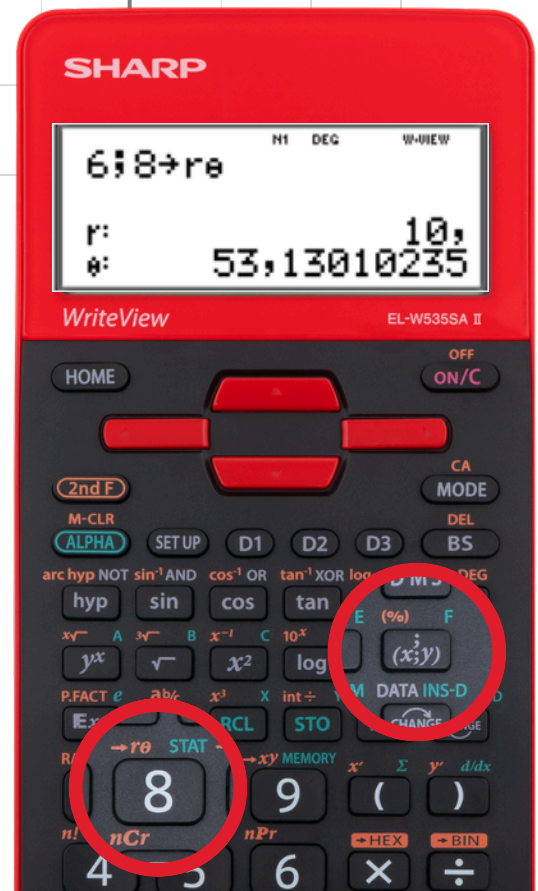
Example:

Calculate the length of the hypotenuse for the red triangle and the blue triangle:



Press: $\boxed{6}$ $\boxed{(x,y)}$ $\boxed{8}$ $\boxed{2ndF}$ $\boxed{8}$ $\boxed{=}$

Press: $\boxed{-}$ $\boxed{6}$ $\boxed{(x,y)}$ $\boxed{8}$ $\boxed{2ndF}$ $\boxed{8}$ $\boxed{=}$



$$a^2 + b^2 = c^2$$

Find us "maths at sharp" on:



YouTube

Normal Mode:

Experimental Probability

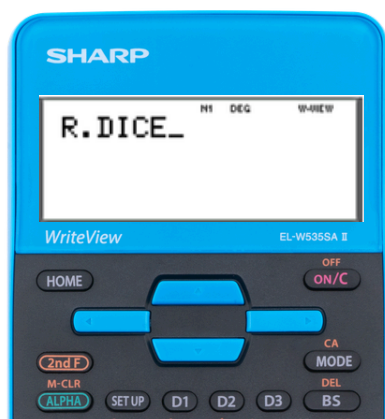
Did you know that your calculator has an experimental probability feature? Your calculator can emulate the rolling of a dice or the tossing of a coin. It can even generate random numbers within an interval.

Example:

Roll a dice 10 consecutive times and record the results. Based on the relative frequency of your results, what is the probability of the dice landing on an even number?

Press:    

Every time you press the “=” button, the calculator will produce the next random number (1-6)

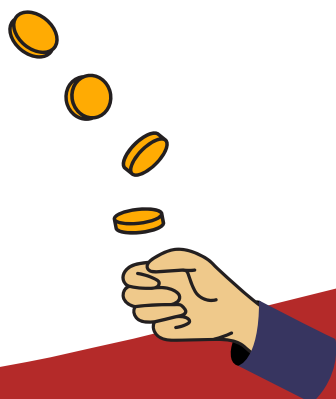


Example:

Toss a coin 10 consecutive times and record the results. Determine the relative frequency of getting tails.

Press:    

Every time you press the “=” button, the calculator will produce either Heads (0) or tails (1) at random.



Find us “maths at sharp” on:



YouTube

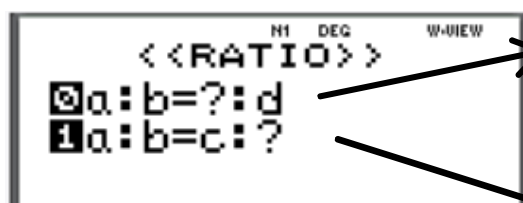
Ratio Mode:

Your new EL-W535SAII now comes with a ratio mode. You can increase or decrease a given ratio.

Example:

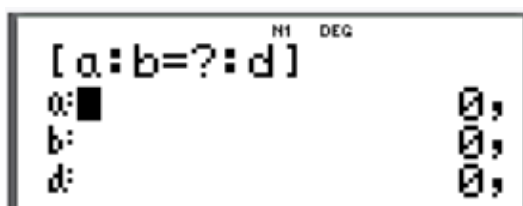
A recipe for making a chocolate cake requires 1,5 cups of flour to 0,5 cup of coco powder. How many cups of flour are needed if you use 3 cups of coco powder?

Press: **CA** **MODE** **6**



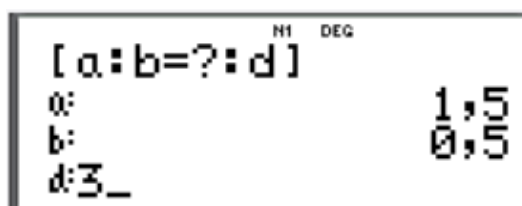
If you know by how much the second value is increasing/decreasing by, use this option.

Press: **0**



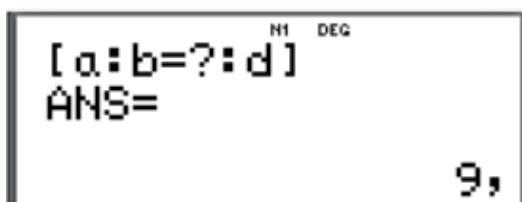
If you know by how much the first value is increasing/decreasing by, use this option.

Press: **1** **,** **5** **DEG** **ANS** **=** **ENTER**



Press: **0** **,** **5** **DEG** **ANS** **=** **ENTER**

Press: **3** **DEG** **ANS** **=** **ENTER**



Find us "maths at sharp" on:



YouTube

Stats Mode:

Our Scientific Calculators are the only Calculators that provide a summary of Statistics. All your data is displayed at once, lets look at an example:

Example:

Students in a grade 9 class, receive the following marks for a test out of 25 marks. The results were recorded in the table below:

18	7	22	15	3	19	22	11	16	20
----	---	----	----	---	----	----	----	----	----

a) Determine the average mark for the class.

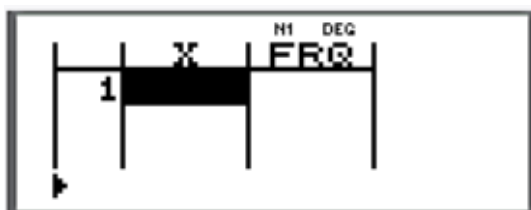
b) Provide the 5 number summary for the Data:

- Minimum
- Q1
- Median
- Q3
- Maximum

Represent this as a box and whisker plot.



Press: **CA** **MODE** **1** **0**



Press: **1** **8** **=** **7** **=** **2** **2** **=** **1** **5** **=** **3** **=**
1 **9** **=** **2** **2** **=** **1** **1** **=** **1** **6** **=** **2** **0**

Press: **DATA INS-D** **CHANGE** **M-CLR** **ALPHA** **8** **0**

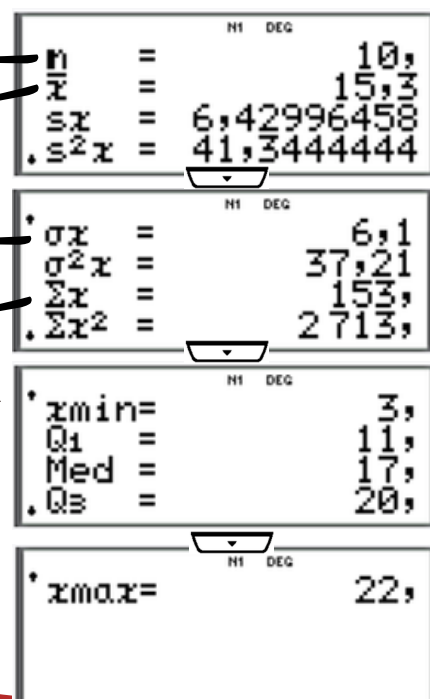
The number of values in your data set.

The mean/average

Standard deviation

Sum of all values in data set.

5 Number summary
(Box and whisker plot)



Find us "maths at sharp" on:



YouTube

Table Mode:

Straight Line Graphs:

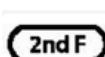
On the topic of number patterns, page 14, we used table mode to check our equation for the number pattern. The number pattern example was a constant difference. We were subtracting the same number each time to get the next value in the sequence. Straight line graphs are number patterns with a constant difference. The constant difference is the gradient of the graph.

Example:

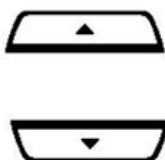
Represent the equation below on a Cartesian plane.

$$y = 2x - 3$$

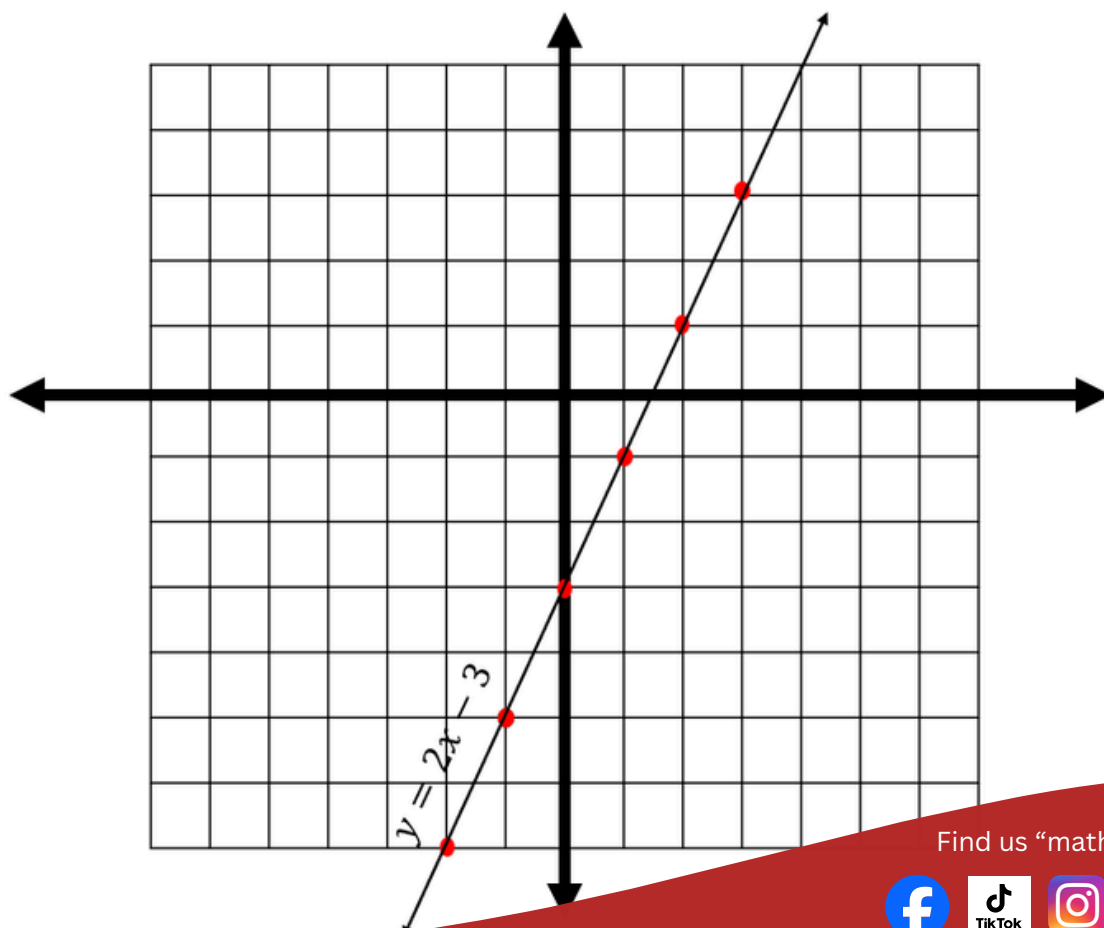
Press:  

Press:           

X	Y
-2	-7
-1	-5
0	-3



Press the up or down arrow to find coordinates for negative and positive X values.



Find us "maths at sharp" on:



YouTube

Table Mode:

Solving Linear and Quadratic Equations:

You can use table mode to find the solutions to algebraic equations if the solution(s) is an integer number. Lets have a look at some examples:

Example:

Solve the following equation:

$$5(x + 3) = 25$$

Step 1:

Make the equation equal to zero by subtracting 25 to both sides of the equal sign

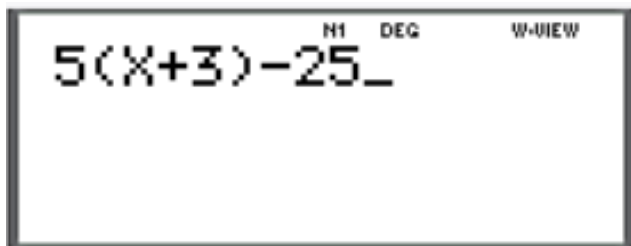
$$5(x + 3) = 25$$

$$5(x + 3) - 25 = 25 - 25$$

$$5(x + 3) - 25 = 0$$

On your calculator, Press:  

Then, press:               



X		ANS
0		-10
1		-5
2		0

Why does this work in table mode?

The solution to the equation is the x intercept for the graph. This is where the graph crosses over the x axis. When you are solving an equation, you are finding the x intercept.

When the answer is equal to zero, the X value is the solution to the equation.

Find us "maths at sharp" on:



YouTube

Table Mode:

Solving Linear and Quadratic Equations:

Example:

Solve the following equation:

$$x^2 - 4x - 21 = 0$$

On your calculator, Press: **CA** **MODE** **2**

Then, press:



N1 DEG	
X	ANS
-3	0
-2	-9
-1	-16

-3,

Press the  button and the  button to look for when the answer is equal to zero.

When the answer is equal to zero, the X value is the solution to the equation.

Therefore:

$$x = -3 \text{ or } x = 7$$

The inverse of these solutions is what you will write in the two sets of brackets.

$$(x + 3)(x - 7) = 0$$

Find us "maths at sharp" on:



YouTube

Table Mode:

Finance: Simple Interest:

You can use table mode to view interest growth year on year. Lets have a look at an example:

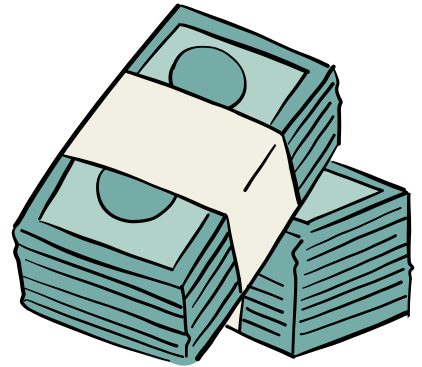
Example:

Daniel takes out a loan from his dad to buy a laptop. The cost of the laptop is R22 000.00. His dad charges him 5% simple interest and lets him pay back the loan in 4 years. Calculate how much Daniel pays back his dad for the Laptop.

$$A = P(1 + r \times t)$$

$$A = 22000 \left(1 + \frac{5}{100} \times 4 \right)$$

$$A = 26400$$



2 2

On your calculator, Press:

0 0 0 (1 + 5 a/b 1 0 0 × 4) =

NI DEG W-VIEW
22000(1+ $\frac{5}{100}$ ×4)=
26 400,

Find us "maths at sharp" on:



YouTube

Table Mode:

Finance: Break even

You sell food at a food market on a Saturday. The stand costs R500 to rent for the day. Its costs you R20 to produce 1 meal. You sell each meal for R40. How many meals do you need to sell to break even?

Cost equation:

$$500 + 20x$$

Rent for the day

Cost per meal multiplied by "x" number of meals

Sales equation:

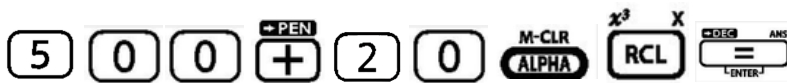
$$40x$$

selling price per meal multiplied by "x" number of meals

On your calculator, Press:



Then Press:



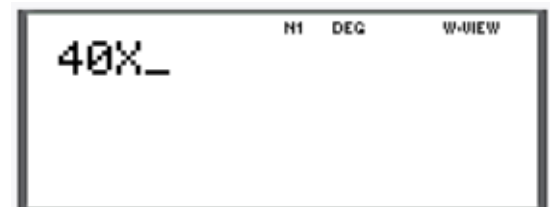
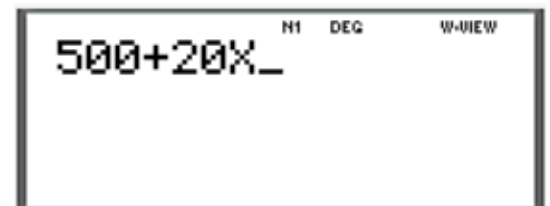
Then Press:



Then Press:



To find the break even point, use the  button to find the position where both ANS1 and ANS 2 are the same.



	X	ANS1	ANS2
0		500	0
1		520	40
2		540	80



The 25th meal sold is the point of break even. This is when your expenses are equal to your sales. Every sale after this becomes profit.

Find us "maths at sharp" on:



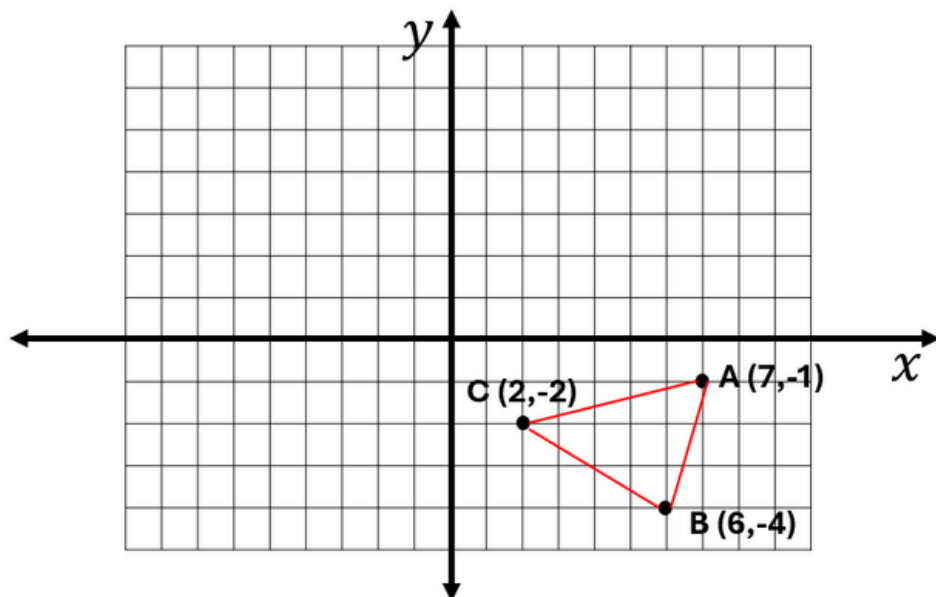
YouTube



Transformation Geometry:

Translations:

Translate triangle ABC, 6 units to the left and 5 units up.



Each coordinate pair will translate (move) 6 units to the left: $x-6$ and 5 units up: $y+5$ so that triangle ABC will be in its new position.

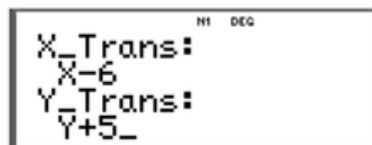
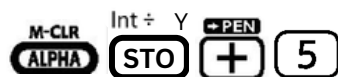
On your calculator, Press:



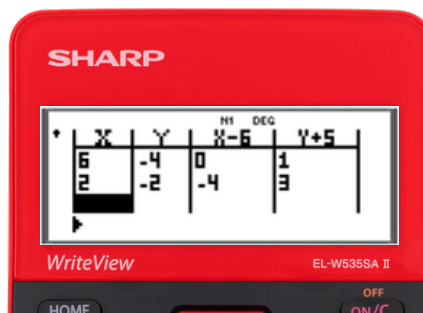
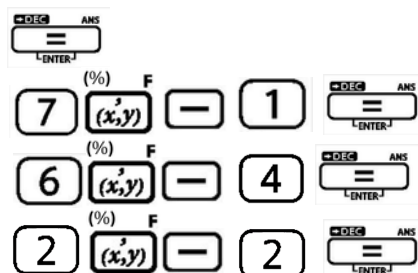
Then, press:



Then, press:



Then, press:



Find us "maths at sharp" on:



YouTube

Transformation Geometry:

Reflections:

Rules to study:

If you are reflecting a pair of coordinates about the **x axis**, then the x value remains the same and the y value changes to its opposite.

If you are reflecting a pair of coordinates about the **y axis**, then the x value changes to its opposite and the y value remains the same.

Use the triangle on page 25 and reflect about the y axis:

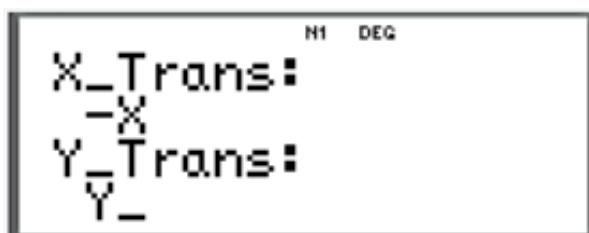
On your calculator, press:



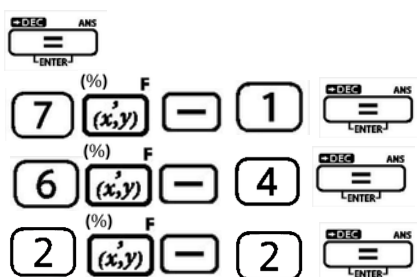
Then, press:



Then, press:



Then, press:



Find us "maths at sharp" on:



YouTube

Transformation Geometry:

Rotations:

Rules to study:

Clockwise Rules	
Rotation	Rule
90°	$(x; y) \rightarrow (y; -x)$
180°	$(x; y) \rightarrow (-x; -y)$
270°	$(x; y) \rightarrow (-y; x)$
Anticlockwise Rules	
Rotation	Rule
90°	$(x; y) \rightarrow (-y; x)$
180°	$(x; y) \rightarrow (-x; -y)$
270°	$(x; y) \rightarrow (y; -x)$

Did you notice that:

180 degrees clockwise and 180 degrees anticlockwise are the same?

90 degrees clockwise is the same as 270 degrees anticlockwise?

90 degrees anticlockwise is the same as 270 degrees clockwise?

Use the triangle on page 25 and rotate it clockwise 180 degrees about the origin.

On your calculator, press:



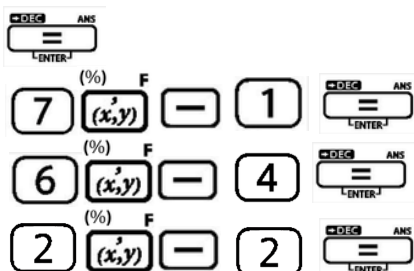
Then, press:



Then, press:



Then, press:



Find us "maths at sharp" on:



YouTube