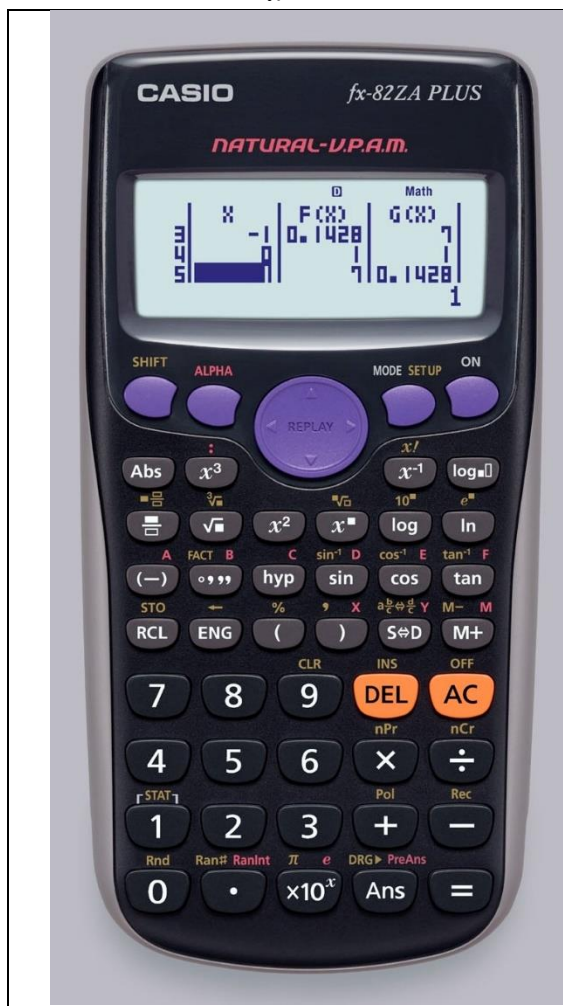# CASIO®

Fx-82ZA PLUS Workshop

Namibia National Maths Congress- Junior Secondary

[SHIFT] [SETUP]

1. **MthIO(Maths Input / Output format)**
2. LineIO(Linear Input / Output format)
3. **Deg (Degrees – angle unit)**
4. Rad (Radians – angle unit)
5. Gra (Gradians – angle unit)
6. Fix (number of Decimal places)
7. Sci (number of Significant digits)
8. **Norm (Exponential display range)**

1. ab/c (Mixed fraction format)
2. **d/c (Improper fraction format)**
3. STAT (Frequency column on / **off**)
4. TABLE (f(*x*) / **f(*x*) and g(*x*)**)
5. Disp (Decimal Point: **Dot** / Comma)
6. Auto Power Off (**10min** / 60min)
7. CONT (Adjusts display contrast)

Before we start we are going to clear and set up the calculator

1) Resetting/ Clearing	2) Normal Mode
[SHIFT] [9]	[SHIFT] [MODE]
``` Clear? 1:Setup 2:Memory 3:All ```	``` 1:MthIO 2:LineIO 3:Deg 4:Rad 5:Gra 6:Fix 7:Sci 8:Norm ```
[3]	[8]
``` Reset All? [=] :Yes [AC] :Cancel ```	``` Norm 1∿2? ```
[=]	[2]
``` Reset All Press [AC] key ```	We select Option 2 so that our answers appear in a decimal format and not scientific notation.

Rounding Off:

We are able to 'fix' numbers to a selected decimal place.

[SHIFT] [MODE]
```
1:MthIO 2:LineIO
3:Deg    4:Rad
5:Gra    6:Fix
7:Sci    8:Norm
```
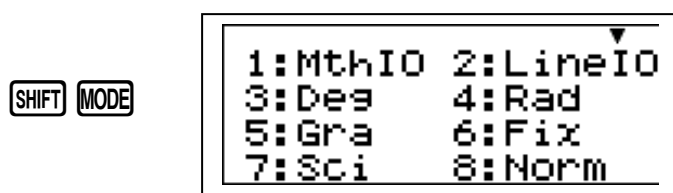
Choose Option [6]
Select the number of Decimal Places you want
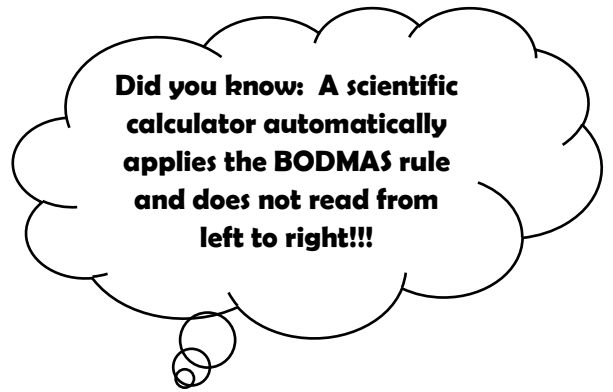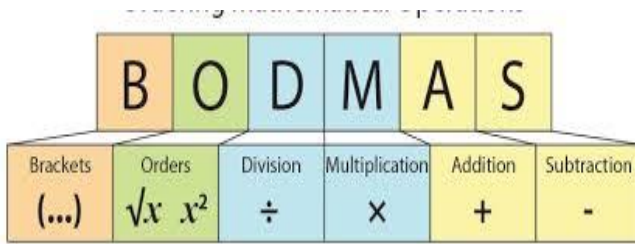Note the word FIX on the top of your screen.
Your answer will now be rounded off to a selected decimal place.
BUT
This must be undone, as it does not automatically go away. Meaning all answers will continuously be rounded to a selected number of decimals and not only the final answers rounded.

Go back to Norm Mode
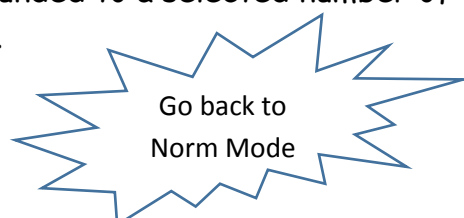
Order of Operations:

Eg1: 2+3x5= _____

Eg2: -9^2 = _____   *Oops!!*

Now try this: (− 9) x^2 = _____

Notes:

_____

_____

_____

_____

Prime Factors:

Calculate the prime factors of 120. Write your answer as a product of its primes. _____

Key Sequence: 1 2 0 =
SHIFT ○,,,

120

Math ▲

$2^3 \times 3 \times 5$
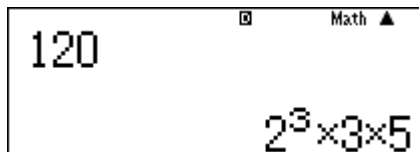
⚠ **Please note that leaners are still required to show all working out!! The calculator is used to check answers** ☺

Now try this: Calculate the prime factors of 2017.

What do you notice?? _____

Eg: Calculate the prime factors of 36. _____

Fractions:

Mixed Fractions:

Convert $2\frac{1}{3}$ into an improper fraction

Let's look at the difference between the following key sequences:

Math ▲
$2\frac{1}{3}$
$\frac{2}{3}$

Math ▲
$2\frac{1}{3}$
$\frac{7}{3}$

What do you notice??

?
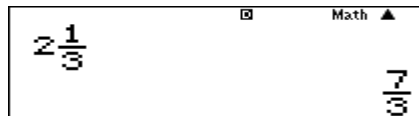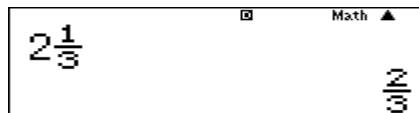
Eg: Calculate $3\frac{2}{3}+3\frac{4}{5}$ _____
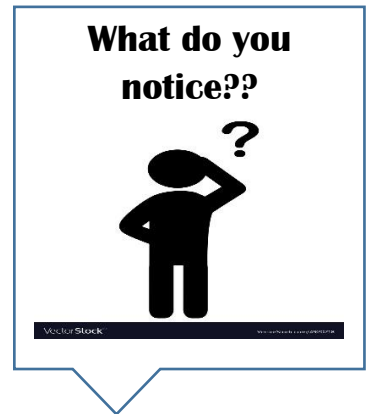
Improper Fractions:

Convert $\frac{18}{15}$ into a mixed fraction

Key Sequence:

Math ▲
$\frac{18}{15}$
$\frac{6}{5}$

Math ▲
$\frac{18}{15}$
$1\frac{1}{5}$

Eg: Convert $\frac{23}{20}$ into a mixed fraction _____

Notes:

_____

_____

_____

_____

_____

_____

Time:

Remember when dealing with time there are 60 seconds in a minute and 60 minutes in an hour. A calculator doesn't know this unless you tell it. You are able to work out Hours, Minutes and Seconds by using the time key.

Rule 1: Always work in Hours, Minutes and Seconds!

Rule 2: Always remember to push the Time Button after every Hour, Minute and Second!

Converting from a Time into a Fraction or Decimal:
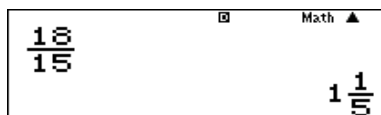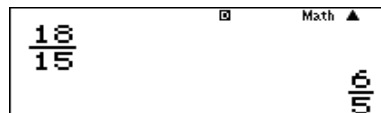
Convert 195 minutes into a fraction _____

Key Sequence:

0 °,,, 1 9 5 °,,, 0 °,,, =
S↔D

```
0°195°0°              Math ▲
                3°15'0"
```
```
0°195°0°              Math ▲
                  13
                  ──
                   4
```

Eg: Write 36 Minutes as a decimal of an hour. _____

Converting from a Fraction or Decimal into Time:

Change 0.9 Hours into minutes

Key Sequence:

0 · 9 = °,,,

```
0.9                  Math ▲

                0°54'0"
```

Eg: Convert $\frac{5}{12}$ Hours into minutes_____

Rate (Speed, Distance and Time):
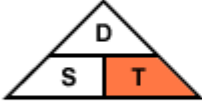
Da

Slow   Turtle

Distance = Speed x Time

$Time = \dfrac{Distance}{Speed}$

$Speed = \dfrac{Distance}{Time}$

Eg1: Dylan needs to travel from Durban to Pietermaritzburg , which is 66km apart. If he travels at a constant speed of 110km/h, how long will it take him?

$Time = \dfrac{Dis\tan ce}{speed}$

$= \dfrac{66km}{110km/h}$

$= \dfrac{3}{5}$ Press **FACT** and this will automatically be converted into time.

= 0' 36' 0"

Eg2: A train takes 2 Hours and 55 Minutes to travel 350km. What is the speed of the train? _____

$\dfrac{350}{2°\ 55°\ 0°}$ Math ▲

120
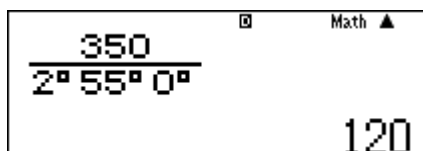
Take note it was input as a fraction and not as a division sum!!

⚠ The calculator can't convert if it is in meters and m/s, due to it 'thinking' in Hours, Minutes and Seconds. You will need to convert to km and km/h first and this may be too time consuming!!

Standard Form and Ordinary Numbers:

Converting from Standard Form into Ordinary Numbers:

Convert $1.36 X 10^5$ _____

Key Sequence:

$\boxed{1}$ $\boxed{\cdot}$ $\boxed{3}$ $\boxed{6}$ $\boxed{\text{x}10^x}$ $\boxed{5}$ $\boxed{=}$

```
                      ⊡      Math ▲
1.36×₁₀5
                              136000
```
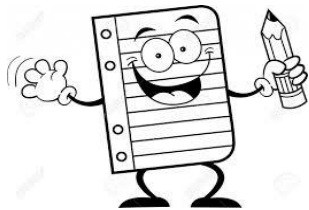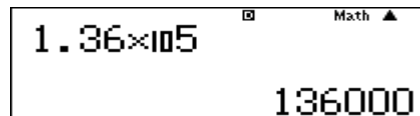
Even though the 5 appears as an exponent in the questions, when we enter it into the calculator we do not need to use the exponent button.

Eg: Write $7 X 10^8$ in the Ordinary Form _____

Converting from Ordinary Numbers into Standard Form:

Convert 8 000 000 into Standard Form _____

First we will need to change the Setup of the Calculator into Scientific Mode.

Key Sequence:

$\boxed{\text{SHIFT}}$ $\boxed{\text{MODE}}$

```
                           ▼
1:MthIO   2:LineIO
3:Deg     4:Rad
5:Gra     6:Fix
7:Sci     8:Norm
```

$\boxed{7}$

```
Sci 0~9?
```

Select how many Significant Digits you will require. We will make use of 3 Significant Digits.

$\boxed{8}$ $\boxed{0}$ $\boxed{0}$ $\boxed{0}$ $\boxed{0}$ $\boxed{0}$ $\boxed{0}$ $\boxed{=}$

```
                     ⊡     SCIMath ▲
8000000
                           8.00×₁₀⁶
```
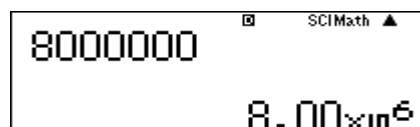
Eg: Write 30 500 in Standard Form _____

Don't FORGET!

Always return back to Normal Mode!!

Drawing Graphs and Completing Tables:

When we are drawing graphs, finding co- ordinates or completing a table we will need to change the mode we are working in.

MODE
```
1:COMP   2:STAT
3:TABLE
```

3
```
              ⬚      Math
f(X)=▌
```

Complete the following table of values for $y = x^2 - 5x + 4$ and then draw the graph.

X	0	1	2	3	4	5
y		0		-2		4

Step 1: Enter the equation

ALPHA) x^2 − 5 ALPHA) + 4

```
              ⬚      Math
f(X)=X²−5X+4
```

Step 2: Press ▣ enter in the g(x) if you have a second equation.
```
              ⬚      Math
g(X)=▌
```
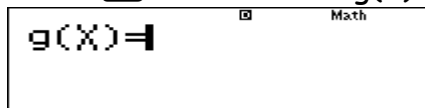
Step 3: Enter in the Start, End and Step.

Notes:

_____

_____

_____

_____

_____

_____

_____

Start?			End?			Step?	
	Math			Math			Math
	0 =			5 =			1 =

This will generate your table, therefore we can complete our given table and draw the graph.
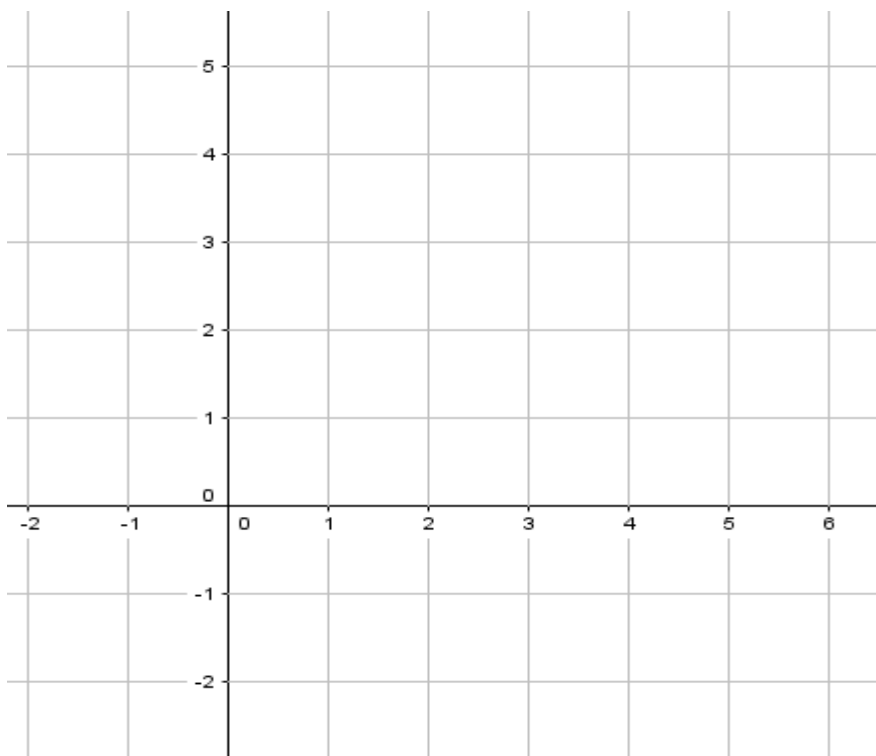
Eg2: Draw the graph of $y = x^3 - 5x + 3$ if $-3 \le x \le 3$

Enter the equation

Start? _____

End?   _____

Step? _____

NB: The domain indicates to us our Start and Ending Points!! ☺
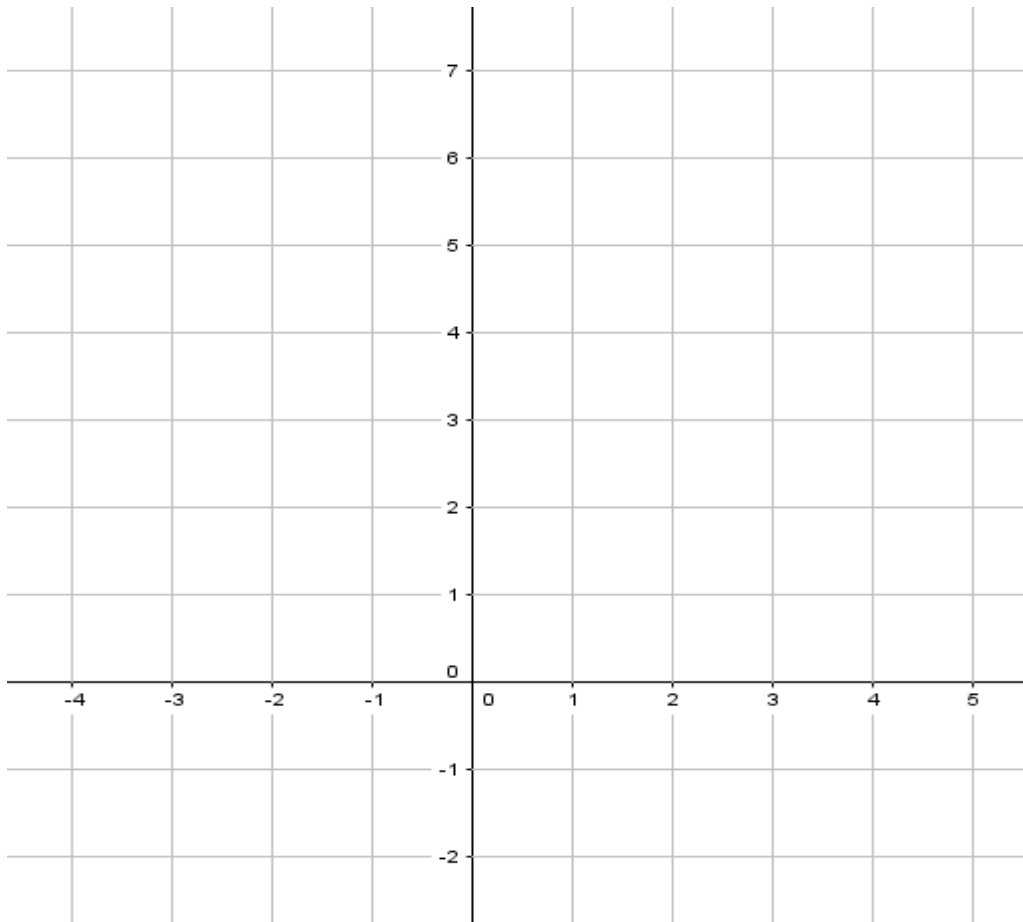
Data Handling and Frequency Tables:

We will need to change our mode again into Stats Mode.

MODE 2
```
1:1-VAR  2:A+BX
3:_+cX²  4:ln X
5:℮^X    6:A·B^X
7:A·X^B  8:1/X
```


Select Option 1 for single variable data handling.

We can choose to have a frequency table on or off when doing data handling.

Switching a Frequency Table On:

Key Sequence:

SHIFT MODE
```
         ▼
1:MthIO  2:LineIO
3:Deg    4:Rad
5:Gra    6:Fix
7:Sci    8:Norm
```

⊙ (down arrow)
```
                ▲
1:ab/c   2:d/c
3:STAT   4:TABLE
5:Disp   6:APO
7:◄CONT►
```

3
```
Frequency?
1:ON     2:OFF
```

1

The following table shows the number of absences from a class over a period of 25 days.

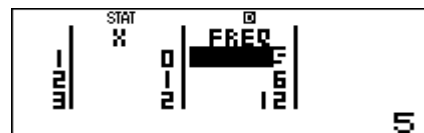| No of Absences (x)	Frequency (f)
0	5
1	6
2	12
3	2

A calculator cannot generate a frequency table from a list of given data, this will have to be done manually.

Use the frequency table to calculate the following:

1) Mean
2) Range

Step 1: Enter in the given data and frequency

Step 2: [AC] [SHIFT] [1]

```
1:Type    2:Data
3:Sum     4:Var
5:MinMax
```

A Stats menu will appear

Breakdown:

Key	Menu Item	Explanation
1. Type	Stats Menu	Changes stats type
2. Data		Displays the data that you input
3. Sum	1. Σx^2 2. Σx	1. Sum of the squares 2. Sum/ Total of data
4. Var	1. n 2. $\bar{x}$ 3. δx 4. sx	Number of samples Mean Population standard deviation Sample standard deviation
5. MinMax	1. Min 2. Max	1. Indicates the minimum value 2. Indicates the maximum value

1) Calculate the mean _____

   Key Sequence:

   [4] | 1:n   2:x̄ | [2] | STAT   ▣ |
        | 3:σx   4:sx | | x̄ |
                               | 0 |

   [=] | STAT   ▣ |
        | x̄ |
        | 1.44 |

   To return to the Stats Menu [AC] [SHIFT] [1]

2) Calculate the Range _____

   Key Sequence:

   [5] | 1:minX   2:maxX | [2] | STAT   ▣ |
                               | maxX |
                               | 0 |

   [−] [SHIFT] [1] [5] [1] | STAT   ▣ | [=] | STAT   ▣ |
                            | maxX-minX | | maxX-minX |
                            | 0 | | 3 |

Eg: The table shows the scores in a quiz for 40 students.

Quiz Score	5	6	7	8	9
Frequency	3	7	17	12	1

Calculate the following:

Mode _____

Mean _____

Median _____

Range _____

⚠ **The calculator can't work out the Mode or Median. These have to be done manually.**

Sum of all the Scores _____

_____