

Why Mental Maths is Important for the Future of Maths

Grades 7, 8 and 9

What Mental Maths Covers

- Everything!
- What it is particularly good for though is
 - Whole Numbers
 - Common Fractions
 - Number Patterns
 - Number Sentences
 - Measurement
 - Probability



Where does Mental Maths Lead Us?

- Whole numbers
 - lead us to understand factorising (grade 9 upwards);
 - Everyday maths – rounding off, shopping, banking, investing
- Common Fractions
 - Percentages, decimals, algebraic fractions (grade 10 – 12)
- Number Patterns and Number Sentences
 - Algebra, solving problems, thinking abstractly, sequences (grade 10 – 12)
- Measurement
 - Planning a house, moving in, cooking, planning trips
- Probability
 - Gambling 😊

Fun ideas for Introducing concepts like

- Addition and subtraction
- Multiples
- Factors
- Prime Factors
- Denominators
- Patterns
- Time
- Probability

Addition and Subtraction – Drill Mode

- Press 
- Press 
- And choose 3 for Drill
 - You have two options:
 - Math
 - Table



- Math

- Covers plus, minus, times or divide separately or as a set of mixed questions

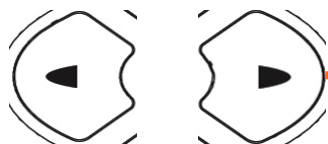
- Table (Multiplication)

- Only tests a specific times table, for example, the 7 or 8 times table.



Choose 0 for Math

- Use your left and right arrows to choose between + , - , X, ÷, or + - X ÷.




- Use your up and down arrows to choose between the different numbers of questions: 25, 50 or 100



- Press the  button when you are ready to start.



On your screen you should see:

- Q 1/25
 - Means that you are on question 1 of 25 questions
- Your question may not be the same as the example because all the questions are generated randomly.
- Type in the answer to your question, e.g. mine would be 5 and press 
- If you are correct you will get a tick, if you are wrong, the question will be marked wrong and will be repeated again.



Correct answer



Incorrect answer



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Multiples -Table Mode

- Press **MODE** 2
- Type in the number you would like multiples of – e.g. 17.
- Then press **RCL** **RCL**
- And **=** 4 times to get to the table.
- Scroll down your table to see all the multiples!



And as you scroll down the table

	X	N1 DEG	ANS
0			0
1			17
2			34

0.

	X	N1 DEG	ANS
11			187
12			204
13			221

13.

	X	N1 DEG	ANS
3			51
4			68
5			85

5.

	X	N1 DEG	ANS
28			476
29			493
30			510

30.

	X	N1 DEG	ANS
7			119
8			136
9			153

9.

	X	N1 DEG	ANS
10			-119
-6			-102
-5			-85

-7.

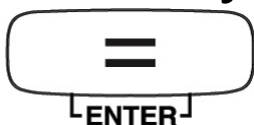
Factors

- Press **ON/C** twice
- Type in the number you would like to find all the factor pairs of – e.g. 42
- Press **a/b**
- **RCL** **RCL**
- **=** **=**

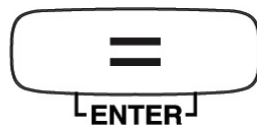


Factor Pairs Cntd.



- Leave your start at 0 so press



- Make your step (what you are counting in) 1 by typing in 1 and press




Factor Pairs Cntd.

- You should now have a table with the first line as 0 and - - -
- Use your  and  arrow keys to scroll through the table.
- Anything in the ANS column with a decimal is NOT a factor because it has a remainder.
- Your factors are 1 and 42, 2 and 21, 3 and 14, 6 and 7.





Remember that the - - - line means that the answer is undefined 😊

Remember that you can go up the table
Press 
And look at the negative side of the number line as well

Prime Factors (Grd 7)

- Press HOME
- Prime Factorisation
 - Type in the number you want to find prime factors of e.g. 78.

• Press  ENTER

• Press  



Denominators

– How to find the LCM and HCF (Grd 7)

- E.g. Given two numbers 42 and 63, what is their LCM and HCF?
 - Find the prime factors of 42 and 63

- $42 = 2 \times 3 \times 7$
- $63 = 3^2 \times 7$
- Line up the factors that are the same in the same columns and create new columns for each factor that doesn't match:
 - $2 \times 3 \times 7$
 - $3 \times 7 \times 3$
- That means our HCF is $3 \times 7 = 21$ and our LCM = $2 \times 3 \times 7 \times 3 = 126$ (This is our denominator).

Alternative method (After teaching exponents)

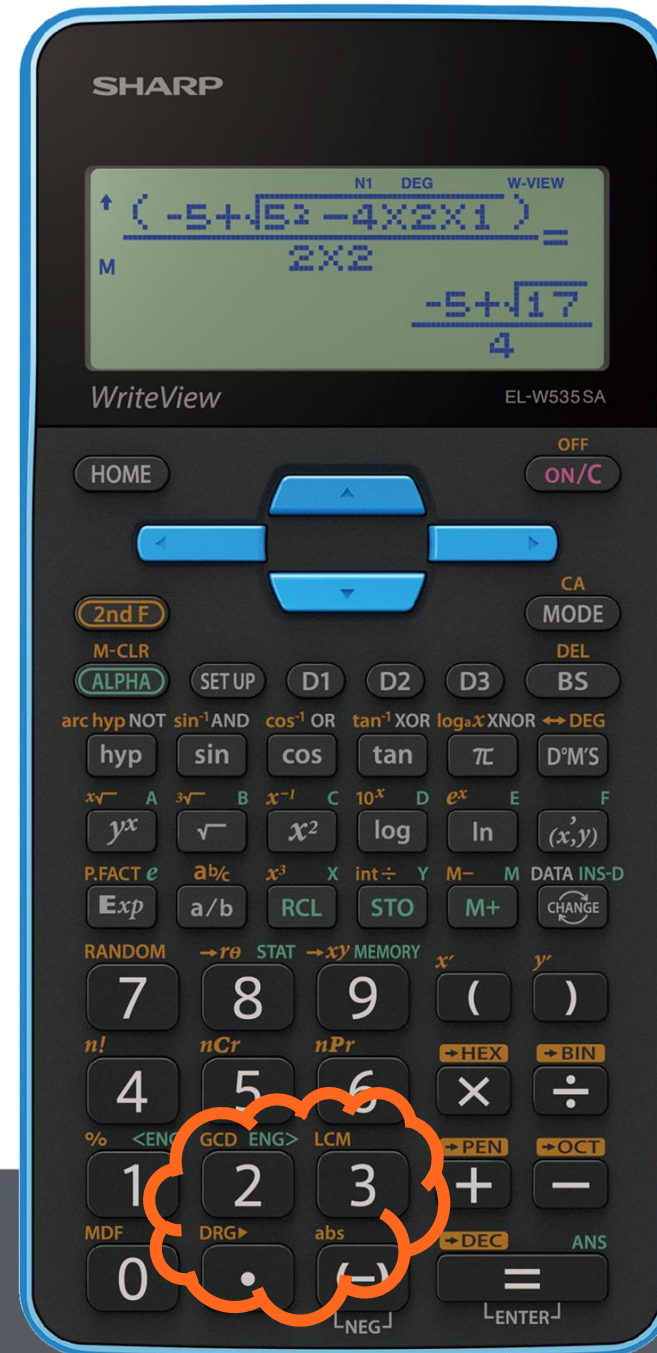
- $42 = 2 \times 3 \times 7$
- $63 = 3^2 \times 7$

- For the HCF find the bases that are common and keep the lowest exponent, so $\text{HCF} = 3^1 \times 7^1 = 21$

- For the LCM (or denominator), keep each base and the highest power of each base, so $\text{LCM} = 2^1 \times 3^2 \times 7^1 = 126$.

And on the calculator shortcut 😊

- New functions:
 - GCD – Greatest common divisor (AKA Highest common factor)
 - LCM – Lowest Common Multiple.



New Functions – GCD

- Greatest Common Divisor or Highest Common Factor.
- E.g. HCF of 48 and 60:
- Press 48 **2ndF** **2**
- 6 0
- **=**
ENTER



GCD continued

- You can do more than 2 numbers at a time, keep adding the GCD function and the next number.

- E.g. 48 **2ndF** **2**
- 60 **2ndF** **2**
- 72 **2ndF** **2** etc
- =**
ENTER



New Functions – LCM

- You can also find the LCM or Lowest Common Multiple
- Find the LCM of 12 and 20:

• Press 12

•  

• 20

• 
[ENTER]



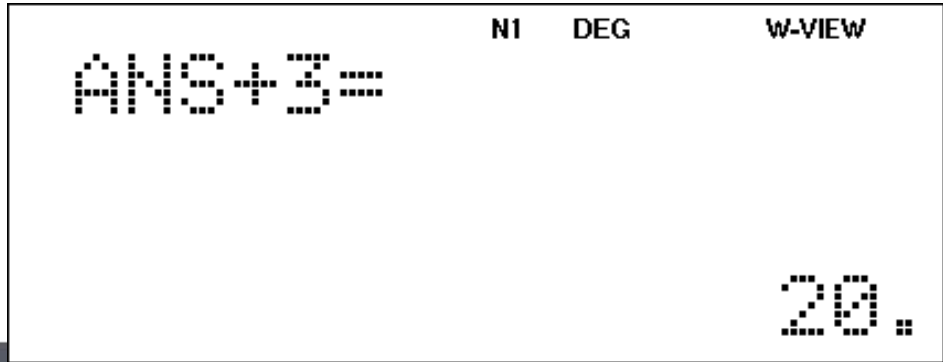
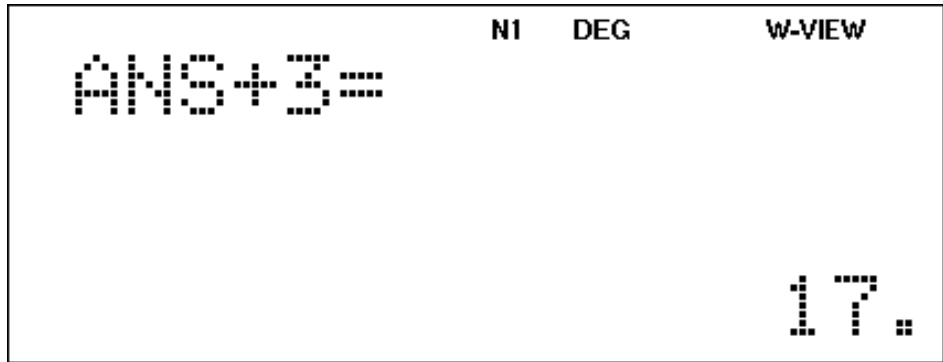
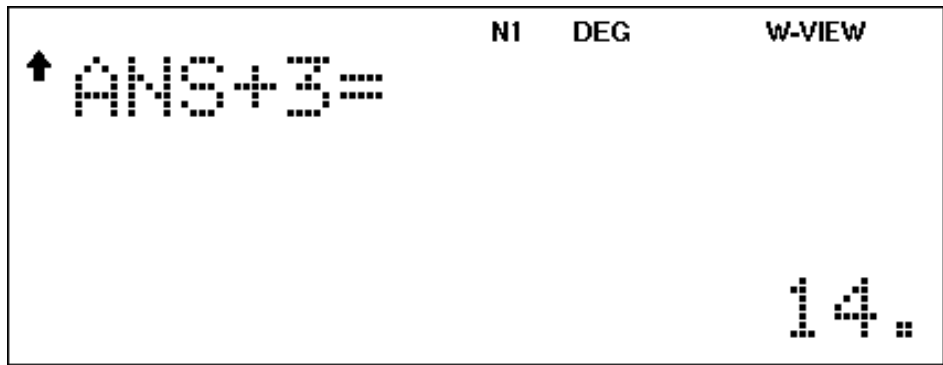
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Patterns

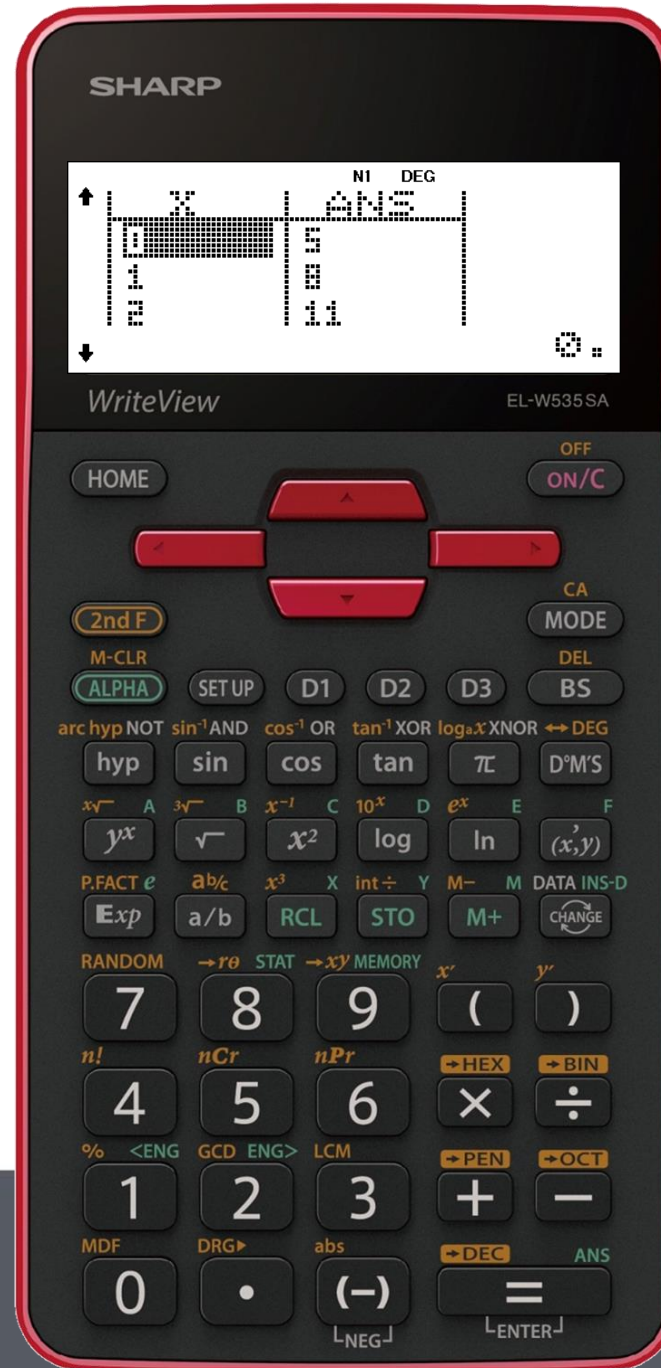
- Our pattern is add 3
- Let's start at 5.
- On your calculator say $5 + 3 =$
- Now press $+ 3 =$
- And keep pressing $=$ to continue the pattern





Second Option

- Press **MODE** 2
- Type in $5 + 3$ **RCL** **RCL**
- **=** **=**
- At the screen with start and step press = and = again.
- Use  to scroll down the table and see the pattern in the ANS column 😊



Time calculations

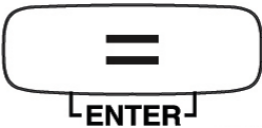
- Press HOME
- “Suzy Train Station Question”
- If Suzy gets on the train at 9:45 and gets off at 14:20, how long was she on the train for?
- Remember to use 24-hour time
- Press 14 $\overset{\leftrightarrow \text{DEG}}{\text{D}^\circ\text{M}'\text{S}}$
- 20 —
- 9 $\overset{\leftrightarrow \text{DEG}}{\text{D}^\circ\text{M}'\text{S}}$
- 45 =
[ENTER]



Answer – 4 hours, 35 minutes and 0 seconds

You can convert this answer to only hours by pressing $\overset{\leftrightarrow \text{DEG}}{\text{2ndF}} \text{D}^\circ\text{M}'\text{S}$ Which should give you $4\frac{7}{12}$ hours.

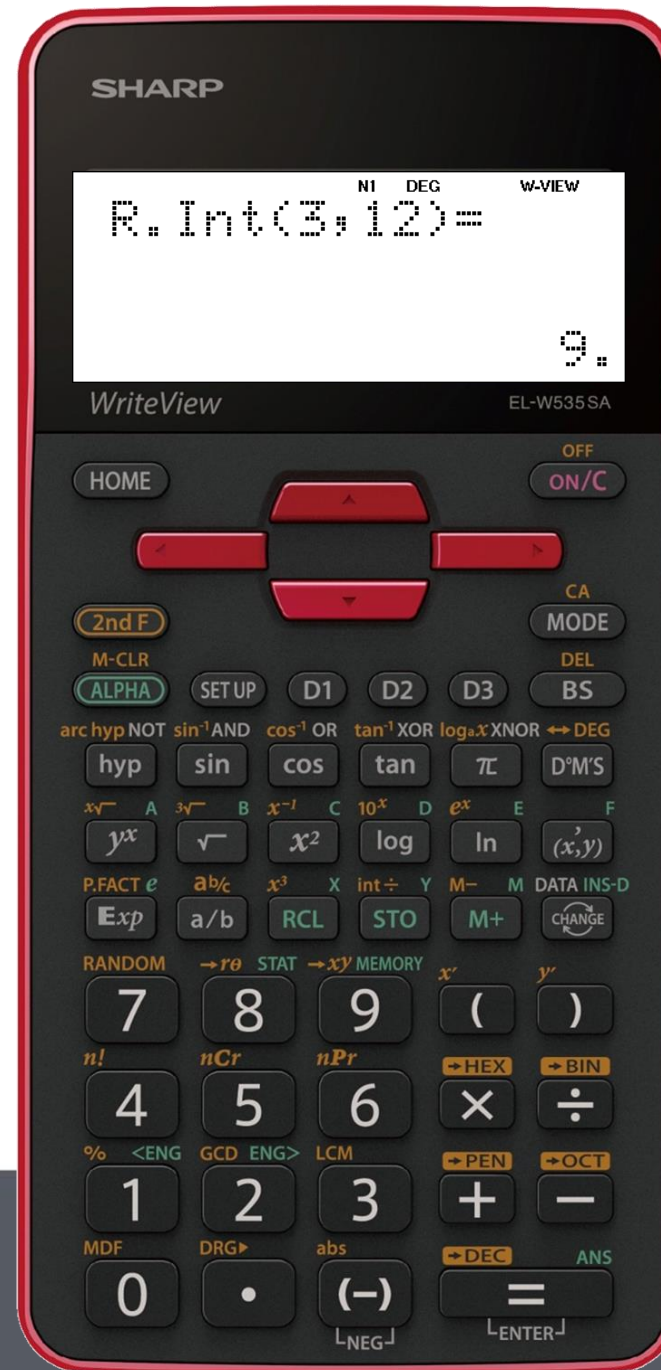
Probability

- Playing with the dice:
- Press **2ndF** 7
 - Choose between:
 - 0: RAND
 - 1: R-DICE
 - 2: R-COIN
 - 3: R-INT(
- Press 1 and then  to roll the dice.



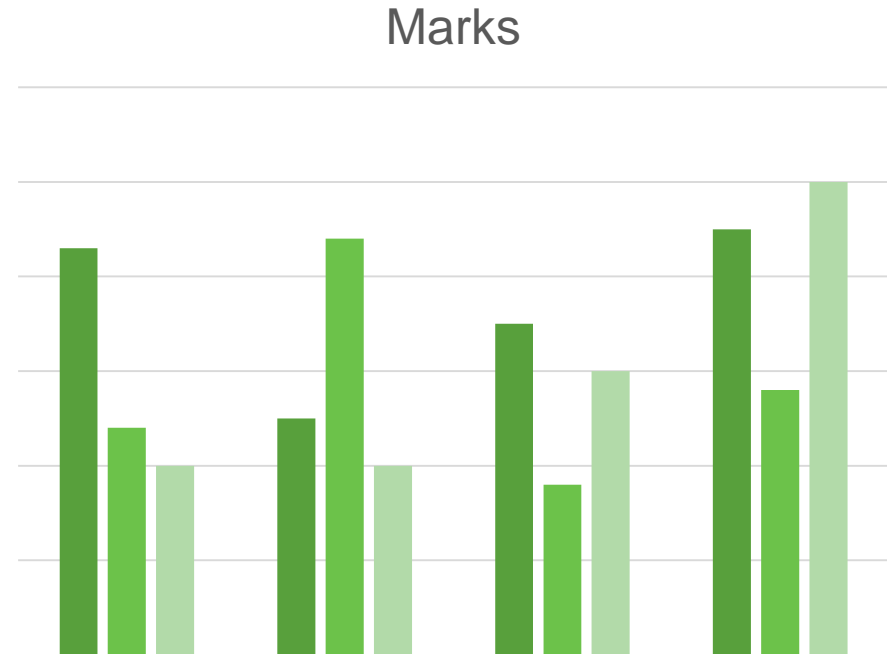
Random Function

- Press **2ndF** 7, 3
- Type in the first number, e.g. 3, then press **(x,y)**, the end parameter, e.g 12 and then press **=**
- Remember you wont have the same answer as the numbers are generated randomly and don't have a set sequence.
- Keep pressing **=** to continue generating random numbers between 3 and 12.








And of course, to save you time:

- Short cut for class marks:
- If you want to convert between the total of your test or exam to another total.
- E.g. If you have an test out of 40 and want to work out percentages.
- You are converting from 40 to 100


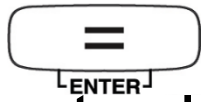
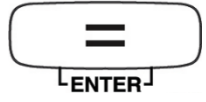


Class marks

- Press 
- What you are converting too goes on top (e.g. 100)
- Press 
- What you are converting FROM goes at the bottom (e.g. 40).
- Press  
- Type in the first student's mark, e.g. 33 and press 



Class marks cntd.

- To change the mark to a decimal press the  key twice.
- Now, without pressing anything else, just type in your next student's mark, e.g. 25 and 
- Continue to do this, mark  until you have finished your class list 😊



New Functions – HOME Button

- When you press HOME, no matter which mode you are in, it will take you straight back to Normal Mode.



New Functions – Int ÷

- Using Int ÷ gives both the quotient and the remainder.

- E.g. $12 \div 5$:

- Press 1 2 **2ndF** **STO** 5

- **=**
ENTER



Thank you 😊

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