

# NUMBER



# GOSE MATHS MEMORY MAT



Important words, formulae and techniques you need to know!

## BIDMAS

Operations must be completed in a certain order, starting from the top of the list.

- B**rackets ( )
- I**ndices <sup>2</sup>
- D**ivision ÷
- M**ultiplication ×
- A**ddition +
- S**ubtraction -

## Standard form

$$5.6 \times 10^3 = 5600$$

- A number 10 to a power.
- Positive powers → large numbers.
- Equal to 1 but less than 10.
- Negative powers → small numbers.

## Rounding

### To place values

- To the nearest 10 → 30
- To the nearest whole number → 27
- To 1 decimal place → 27.1

### To significant figures

- The first significant figure is the highest place value that is **NOT** a zero.
- 27.06** To 1 significant figure → 30
- To two significant figures → 27
- To three significant figures → 27.1

## Estimation

When asked to estimate, you must round all numbers to 1 significant figure then calculate.

### Example

$$\begin{array}{r} 19.8 \times 5.1 \\ \hline 0.5 \\ 20 \times 5 = 100 \\ \hline 1 \end{array}$$

# ALGEBRA

## Straight line graphs

$y = mx + c$   
 Gradient (where the line crosses the y-axis)  
 y-intercept

## Example

The line  $y = 2x + 3$ , has a gradient of 2 and crosses the y-axis at +3.

Vertical lines are written as  $x = ?$

Horizontal lines are written as  $y = ?$

## Keywords

Word	Meaning	Example
<b>Simplify</b>	Write in a more simple way.	$2x - 3y + 4x + 5y = 6x + 2y$
<b>Expand</b>	Multiply what is inside the brackets by the number and/or letter on the outside.	$2(3a + 4) = 6a + 8$
<b>Factorise</b>	Put into brackets.	$10z^2 - 15z = 5z(2z - 3)$
<b>Solve</b>	Work out the value of the letter.	$2b - 1 = 5$ $2b = 6$ $b = 3$
<b>Substitute</b>	Replace the letter(s) with the number(s) provided.	Work out the value of $2x + 3y$ when $x = 6$ and $y = 7$ $2 \times 6 + 3 \times 7 = 33$

## RATIO, PROPORTION & RATES OF CHANGE

### Laws of Indices

<b>Multiplication</b>	$a^2 \times a^3 = a^{2+3} = a^5$ $5y^4 \times 3y = 5 \times 3y^{4+1} = 15y^5$
<b>Division</b>	$x^7 \div x^3 = x^{7-3} = x^4$ $12c^9 \div 3c^4 = 12 \div 3c^{9-4} = 4c^5$
<b>Brackets</b>	$(b^2)^5 = b^{10}$ $(2z^4)^3 = 2^{1 \times 3} z^{4 \times 3} = 8z^{12}$
<b>Zero Law:</b>	$x^0 = 1$

### Compound Measures

Speed	Density	Pressure
S = Speed D = Distance T = Time	D = Density M = Mass V = Volume	P = Pressure F = Force A = Area

## Keywords

Word	Meaning	Example
<b>Sum</b>	Add the numbers together.	$1 + 2 + 3 = 6$
<b>Difference</b>	Biggest number subtract smallest number.	$3 - 2 = 1$
<b>Product</b>	Multiply the numbers.	$2 \times 3 = 6$
<b>Even</b>	A number that divides by 2 without leaving a remainder.	2, 4, 6, 8
<b>Odd</b>	A number that <b>WILL NOT</b> divide by 2 without leaving a remainder.	1, 3, 5, 7, 9
<b>Multiple</b>	The result of multiplying by a whole number.	Multiples of 3 3, 6, 9, 12, 15
<b>Factor</b>	A whole number that will divide another number without leaving a remainder.	Factors of 6 1, 2, 3 and 6
<b>Square</b>	The result of multiplying a number by itself.	$3^2 = 3 \times 3 = 9$
<b>Cube</b>	The result of multiplying a number by itself twice.	$3^3 = 3 \times 3 \times 3 = 27$
<b>Root</b>	A number that multiplies by itself a given number of times to make the number in the root.	$\sqrt{9} = 3$ $\sqrt[3]{27} = 3$
<b>Prime</b>	A number with only 2 factors, 1 and itself.	2, 3, 5, 7, 11
<b>Integer</b>	A whole number.	1