# SECONDARY SCHOOL MATHS BASICS

## REFERENCE SHEET FOR PARENTS!

The way mathematics is taught at school has changed significantly over the years. Here are some basic concepts that every child studying for GCSE examinations would be expected to know. I've produced this reference guide for parents who may be struggling as they help their children with their homework.

## NUMBERS

**SQUARED NUMBER:**
A number multiplied by itself.
*e.g.* 3x3 = 9 - You would write squared as $3^2$

**CUBED NUMBER:**
A number multiplied by itself three times.
*e.g.* 3x3x3 = 27 - You would write 3 cubed as $3^3$

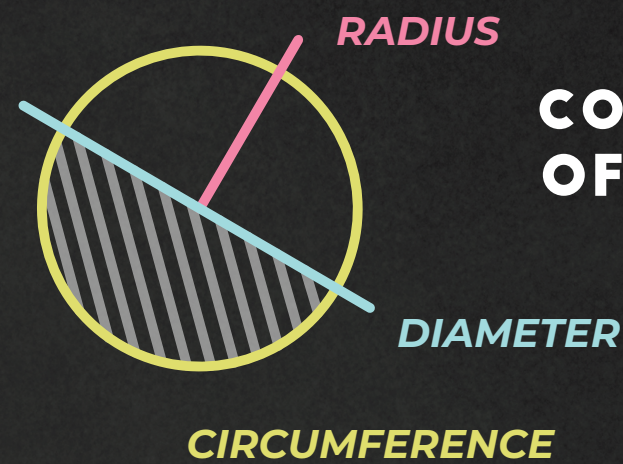**PRIME NUMBER:**
A number divisible by itself and 1
*e.g.* 2, 3, 5, 7, 11

## PI

$\pi$

$\pi = 3.14$ and is a very important mathematical concept, especially when dealing with circles.

**COMPONENTS OF A CIRCLE**

RADIUS
DIAMETER
CIRCUMFERENCE

## AVERAGES

**MODAL:**
Most common number among a set.
For instance, among this set: 3, 9, 8, 9, 14, 9, 4, 9.

9 is the modal number.

**MEDIAN:**
The middle of a set of numbers.
Between *0 and 20*, *10* would be the *median*.

**MEAN:**
The *average* number in a data set.
To calculate, you add up all numbers and divide by how many numbers there are.

**Here is an example:**
Your data set comprises of 5 numbers: *5, 10 ,15, 20, 25.*
- If you *add them together*, you get *75.*
- *Divide* this by *5* and you get the *mean average: 15.*

## CALCULATING AREA

**AREA OF A SQUARE OR RECTANGLE:**
Multiply one side by another.

**AREA OF A CIRCLE:**
$\pi r^2$ (r = radius of the circle)

**AREA OF A TRIANGLE:**
Half length of base x height.

## CALCULATING VOLUME

**PYRAMID:**
Length x width x height divided by 3.

**CUBE:**
Work out the area of one face then multiply by the length.

**PRISM:**
Half base x height x length.

## ORDERING MATHEMATICAL OPERATIONS

You should start with any numbers in brackets, then square numbers (if there are any), then division, multiplication and so on.

BODMAS is an acronym and a way of remembering the rules for attempting a calculation. It stands for:
**B**rackets **O**rder **D**ivision **M**ultiplication **A**ddition **S**ubtraction

# BODMAS

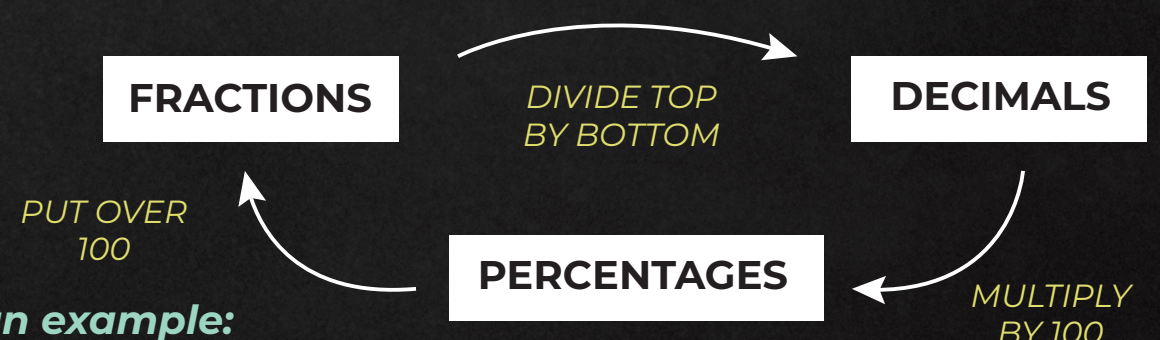| BRACKETS | ORDERS | DIVISION | MULTIPLI-CATION | ADDITION | SUB-TRACTION |
|---|---|---|---|---|---|
| (..) | $\sqrt{}\ x^2$ | ÷ | ✗ | + | − |
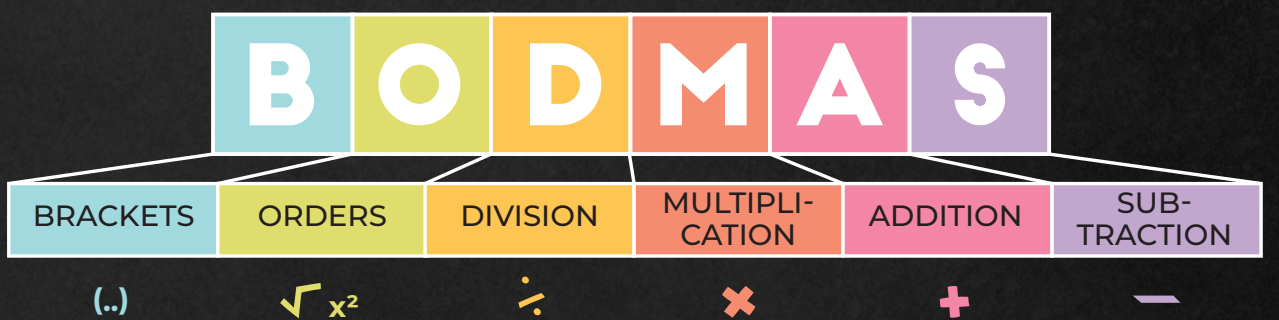
## GEOMETRY

- Any angles on a straight line will always add up to 180˚

- The angles of a triangle will always add up to 180˚.

- Angles on a square or cuboid shape will always add up to 360˚

## CONVERTING FRACTIONS

### DECIMALS + PERCENTAGES

FRACTIONS → *DIVIDE TOP BY BOTTOM* → DECIMALS

FRACTIONS ← *PUT OVER 100* ← PERCENTAGES

PERCENTAGES ← *MULTIPLY BY 100* ← DECIMALS

**Here's an example:**
1) Let's take the fraction of ¼.
2) Divide 1 by 4 and you get the decimal, 0.25
3) Multiply 0.25 by 100 and you get 25%