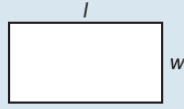


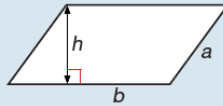
## GCSE Maths Things to Remember!

### Areas

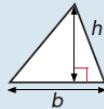
Rectangle =  $l \times w$



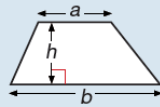
Parallelogram =  $b \times h$



Triangle =  $\frac{1}{2} b \times h$



Trapezium =  $\frac{1}{2} (a + b)h$

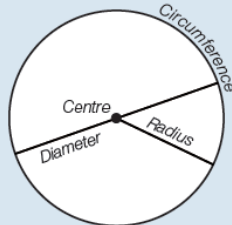


### Circles

Circumference =  $\pi \times \text{diameter}$ ,  $C = \pi d$

Circumference =  $2 \times \pi \times \text{radius}$ ,  $C = 2\pi r$

Area of a circle =  $\pi \times \text{radius squared}$ ,  $A = \pi r^2$



### Compound measures

Speed

$$\text{speed} = \frac{\text{distance}}{\text{time}}$$



Density

$$\text{density} = \frac{\text{mass}}{\text{volume}}$$

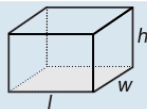


Pressure

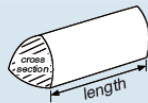
The formula for pressure does not need to be learnt, and will be given within the relevant examination questions.

### Volumes

Cuboid =  $l \times w \times h$



Prism = area of cross section  $\times$  length



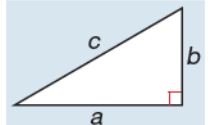
Cylinder =  $\pi r^2 h$



### Pythagoras

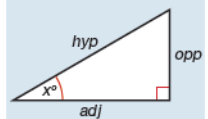
Pythagoras' Theorem

For a right-angled triangle,  
 $a^2 + b^2 = c^2$



Trigonometric ratios (*new to F*)

$$\sin x^\circ = \frac{\text{opp}}{\text{hyp}}, \cos x^\circ = \frac{\text{adj}}{\text{hyp}}, \tan x^\circ = \frac{\text{opp}}{\text{adj}}$$



## Adding Fractions

**You Cannot:**

$$\frac{2}{3} + \frac{3}{4}$$

**You Can:**

$$\frac{8}{12} + \frac{9}{12}$$

**DENOMINATORS MUST BE THE SAME WHEN WE ADD AND SUBTRACT FRACTIONS !!!**

## Angle Rules

Angles on a straight line

- Angles on a straight line add up to  $180^\circ$

Angles around a point

- Angles around a point add up to  $360^\circ$

Angles in a Quadrilateral

- Angles in a quadrilateral (4-sided shape) add up to  $360^\circ$

Angles in a Triangle

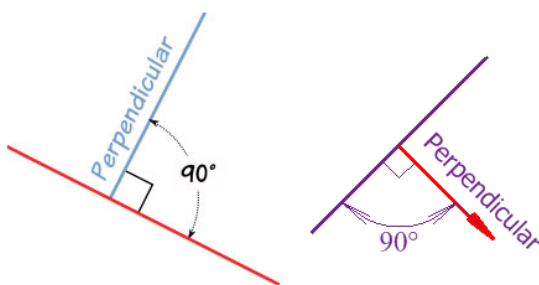
- Angles in a triangle add up to  $180^\circ$

## Straight Lines

### Perpendicular

It just means **at right angles ( $90^\circ$ )** to.

The red line is perpendicular to the blue line in both these cases:



### Parallel

Lines are parallel if they are always the same distance apart (called "equidistant"), and will never meet. (They also point in the same direction). Just remember:

**Always the same distance apart and never touching.**

The red line is parallel to the blue line in both these cases:



Example 1

Example 2

## Types of number

Squares: 1, 4, 9, 16, 25, 36, 49, 64, 81, 100, 121, 144, 169, 196, 225

Square rooting: the inverse of squaring  
e.g.  $\sqrt{4} = 2$

Cubes: 1, 8, 27, 64, 125

Factors: a number that divides exactly into another number  
e.g. factors of 10: 1, 2, 5, 10

Multiples: numbers in the times tables  
e.g. multiples of 3: 3, 6, 9, 12, 15...

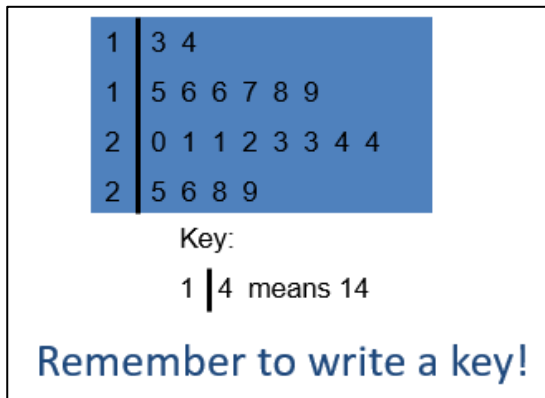
## Averages and Spread

<b>Mode</b>	<b>Median</b>
<ul style="list-style-type: none"><li>The mode is the most common or most popular thing</li></ul>	<ul style="list-style-type: none"><li>The middle value when the numbers are in order</li></ul>
<b>Mean</b>	<b>Range</b>
$\frac{\text{sum of values}}{\text{number of values}}$	$\text{greatest value} - \text{smallest value}$

## Transformations

- Reflection (2 marks)** – State reflection and line of symmetry
- Rotation (3 marks)** – State rotation, centre of rotation, **Degrees of rotation**, Direction clockwise/ anti clockwise
- Enlargement (3 marks)** – State enlargement, centre of enlargement, scale factor
- Translation (2 marks)** – State translation and vector e.g.  $\begin{pmatrix} 2 \\ -4 \end{pmatrix}$

## Stem and Leaf



## Rounding

0.0453682
0.05      2 decimal places
0.045      2 significant figures
468.493628
468.49      2 decimal places
470      2 significant figures

## Estimation

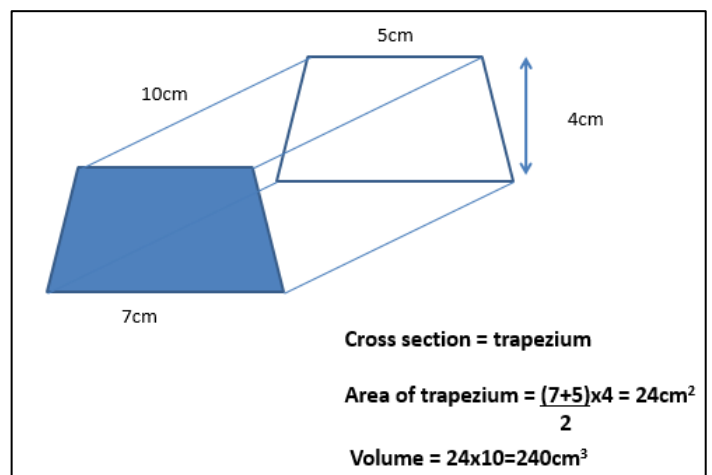
When you are asked to estimate a calculation you need to round!  
e.g. Find an approximate answer to:

$$\frac{213 \times 69}{42}$$

$$\frac{200 \times 70}{40}$$

$$\frac{14000}{40} = \frac{1400}{4} = \frac{700}{2} = 350$$

## Volume of a prism



## Expanding brackets

$$4(d - 3) = 4d - 12$$

$$(x + 3)(x + 2) = x^2 + 5x + 6$$

## Factorising expressions

$$4d - 12 = 4(d - 3)$$

$$x^2 + 5x + 6 = (x + 3)(x + 2)$$

## Properties of Triangles

<p><b>Special Triangles: Equilateral Triangle</b></p> <ul style="list-style-type: none"> <li>All the angles in an Equilateral Triangle are equal (<math>60^\circ</math>)</li> <li>Example: </li> </ul>	<p><b>Special Triangles: Right-Angled Triangle</b></p> <ul style="list-style-type: none"> <li>One angle is 90 degrees</li> <li>Example: </li> </ul>
<p><b>Special Triangles: Isosceles Triangle</b></p> <ul style="list-style-type: none"> <li>The two angles at the base are equal (the base is always the line without a stroke!)</li> <li>Example: </li> </ul>	<p><b>Special Triangles: Scalene Triangle</b></p> <ul style="list-style-type: none"> <li>All angles and side lengths are different</li> <li>Example: </li> </ul>

## Names of Polygons

Number of Sides	Name of polygon
3	Triangle
4	Quadrilateral
5	Pentagon
6	Hexagon
7	Heptagon/Septagon
8	Octagon
9	Nonagon
10	Decagon
11	Hendecagon
12	Dodecagon