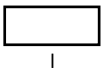
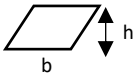
GCSE Foundation/Higher Formula Revision Sheet * formulas in red are given to you in the GCSE

Area (letter abbreviations will also be accepted e.g. l x w

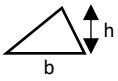
Area of a rectangle = **length x width**



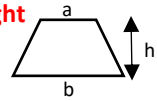
Area of a parallelogram = **base x perpendicular height**



Area of a triangle = **½ x base x perpendicular height**

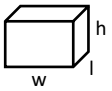


Area of a trapezium = **½ (a + b) x perp height**



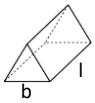
Volume

Volume of a cuboid = **length x width x height**



Volume of a prism = **area of cross-section x length**

Volume of a triangular prism = **½ x base x perpendicular height x length**



Volume of a pyramid = **1/3 x area of base x height**

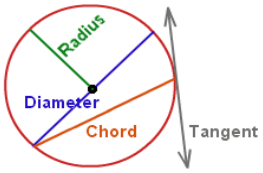
Circles

Circumference of a circle = $\pi \times$ **diameter**

Area of a circle = $\pi \times \text{radius}^2$

Volume of a cylinder = $\pi \times \text{radius}^2 \times$ **height**

Parts of a circle



Angles in polygons

Sum of interior angles = **(n – 2) x 180°**

(where n is the number of sides)

Exterior angles add upto **360°**

One exterior angle in a REGULAR polygon adds upto $\frac{360^\circ}{n}$

A pair of interior and exterior angles add upto **180°**

Interior angles in polygons

Interior angles of a triangle add upto	**180°**
Interior angles of a quadrilateral add upto	**360°**
Interior angles of a pentagon add upto	**540°**
Interior angles of a hexagon add uptp	**720°**
Interior angles of an octagon add upto	**1080°**

Constructing Pie Charts

Angle = $\frac{\text{frequency}}{\text{total}} \times 360^\circ$

Angles in parallel lines

(Z-angles) **Alternate** angles are **equal**

(F-angles) **Corresponding** angles are **equal**

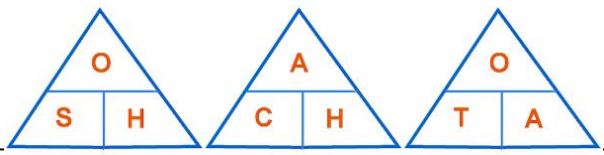
(C-angles) **Co-interior** angles add to **180**

Pythagoras & Trigonometry

Pythagoras Theorem $a^2 + b^2 = c^2$

Trigonometry

$\sin(x) = \frac{\text{opp}}{\text{hyp}}$ $\cos(x) = \frac{\text{adj}}{\text{hyp}}$ $\tan(x) = \frac{\text{opp}}{\text{adj}}$



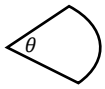
Compound Measures

$\text{speed} = \frac{\text{distance}}{\text{time}}$ $\text{density} = \frac{\text{mass}}{\text{volume}}$

GCSE Higher Formula Revision Sheet

Circles

Area of a sector = $\frac{\theta}{360^o} \times \pi \times \text{radius}^2$



Length of an Arc = $\frac{\theta}{360^o} \times \pi \times \text{diameter}$

Quadratic Equations

The solutions of $ax^2 + bx + c = 0$

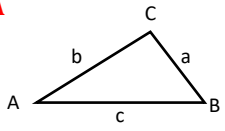
where $a \neq 0$ are given by $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

Trigonometric formulae

Sine Rule $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

Cosine Rule $a^2 = b^2 + c^2 - 2bc\cos A$

Area of a triangle = $\frac{1}{2}ab\sin C$



Histograms

$$\text{frequency density} = \frac{\text{frequency}}{\text{class width}}$$

Gradient of a Line

$$m = \frac{y_2 - y_1}{x_2 - x_1}$$

Midpoint of two points

between (x_1, y_1) and (x_2, y_2)

$$\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$$

Equation of a straight line

$$y = mx + c$$

m represents the **gradient**

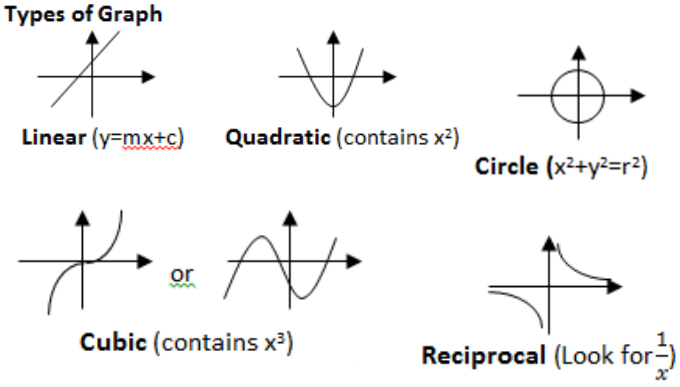
c represents the **y intercept**

Perpendicular gradient

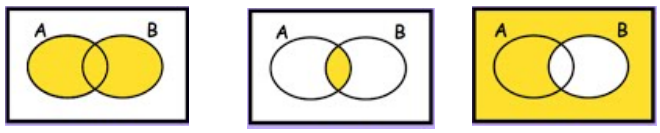
Given a gradient of a line m, the gradient of the line is perpendicular to it is:

$$-\frac{1}{m}$$

Types of Graph



Venn diagrams



Compound Growth & Decay

$$P \times \left(1 \pm \frac{r}{100}\right)^n$$

Where r is the interest rate
P is the principal amount,
n is the number of years

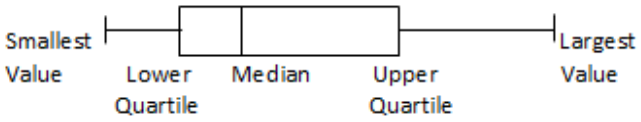
± means use + for growth/compound interest and use – for decay

Percentage increase/decrease or Percentage profit

% increase/decrease = $\frac{new - original}{original} \times 100$

Cumulative Frequency - plot the **upper bound** of the class interval and the frequency.

Box Plots



Frequency Polygons – plot the **midpoint** and the frequency

Comparing datasets – comment on the **median or mean** and the **IQR or range.**