

Maths Equations to Memorise

Statistics

Compound Interest:

$$\text{New Value} = \text{Original} \times \left(1 + \frac{\% \text{ Increase}}{100}\right)^{\text{time}}$$

Depreciation:

$$\text{New Value} = \text{Original} \times \left(1 - \frac{\% \text{ Decrease}}{100}\right)^{\text{time}}$$

Calculating percentage of an amount:

$$\text{Percentage} = \left(\frac{\text{Amount}}{\text{Total}}\right) \times 100$$

Percentage Change:

$$\text{Percentage change} = \left(\frac{\text{Difference}}{\text{Original}}\right) \times 100$$

Calculating original value after percentage change:

$$\text{Original Value} = \text{New Value} \left(1 \frac{\pm\%}{100}\right)$$

Stratified Sampling:

$$\text{Amount in Sample} = \frac{\text{Group Number}}{\text{Total}} \times \text{Sample Size}$$

Histograms:

$$\text{Frequency Density} = \frac{\text{Frequency}}{\text{Class Width}}$$

Geometry

Area of a triangle:

$$\text{Right Angle Triangle} = \frac{1}{2} \text{Base} \times \text{Perpendicular Height}$$

$$\text{Area of a Triangle} = \frac{1}{2} a b \sin(c)$$

Area of a circle:

$$\text{Area of a Circle} = \pi r^2$$

Circumference of a circle:

$$\text{Circumference of a Circle} = \pi D$$

Area of a sector:

$$\text{Area of a Sector} = \left(\frac{\text{Angle}}{360}\right) \times \pi r^2$$

Area of a parallelogram:

$$\text{Area Parallelogram} = \text{Base} \times \text{Vertical Height}$$

Area of a trapezium:

$$\text{Area of Trapezium} = \frac{1}{2}(a + b) \times \text{Vertical Height}$$

Perimeter of a sector:

$$\text{Perimeter of a Sector} = \left(\left(\frac{\text{Angle}}{360}\right) \times \pi D\right) + 2r$$

Regular polygons:

$$\text{Sum of interior Angles} = (\text{Number of Sides} - 2) \times 180$$

Exterior angle of a regular polygon:

$$\text{Exterior Angle} = \frac{360}{\text{Number of Sides}}$$

Volume of a cuboid:

$$\text{Volume} = \text{Length} \times \text{Width} \times \text{Height}$$

Volume of a prism :

$$\text{Volume} = \text{Area of Cross Section} \times \text{Length}$$

Volume of a cylinder:

$$\text{Volume} = \pi r^2 h$$

Volume of a pyramid:

$$\text{Volume} = \frac{1}{3} \text{Area of Base} \times \text{Vertical Height}$$

Pythagoras and Trigonometry

Pythagoras Theorem:

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

Trigonometric ratios:

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

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

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

The Sine rule

$$\frac{a}{\sin(A)} = \frac{b}{\sin(B)} = \frac{c}{\sin(C)}$$

The Cosine rule

$$a^2 = (b^2 + c^2) - 2bc \cos(A)$$

$$\cos(A) = \frac{b^2 + c^2 - a^2}{2bc}$$

Compound Measures

Speed:

$$\text{Speed} = \frac{\text{Distance}}{\text{Time}}$$

Density:

$$\text{Density} = \frac{\text{Mass}}{\text{Volume}}$$

Pressure:

$$\text{Pressure} = \frac{\text{Force}}{\text{Area}}$$

Algebra

The Quadratic equation:

$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

Proportionality:

$$y = kx \quad y = kx^2 \quad y = \frac{k}{x} \quad y = \frac{k}{x^2}$$