

IGCSE Mathematics 0580 Formulae List

Numbers

Laws of indices:

$$a^m \times a^n = a^{m+n}$$

$$a^m \div a^n = a^{m-n}$$

$$(a^m)^n = a^{mn}$$

$$(ab)^n = a^n b^n$$

$$(a/b)^n = a^n/b^n$$

Simple interest:

$$I = P \times r \times t \quad A = P(1 + r \times t)$$

Compound interest:

$$A = P(1 + r)^n$$

Percentage change:

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

Proportion:

$$\text{Direct: } y = kx \quad \text{Inverse: } y = \frac{k}{x}$$

Algebra and Graphs

Linear equation:

$$y = mx + c$$

Gradient:

$$m = (y_2 - y_1) \div (x_2 - x_1)$$

Midpoint:

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

Distance:

$$\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

Quadratic formula:

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

Arithmetic sequence:

$$a_n = a_1 + (n - 1)d$$

Geometric sequence:

$$a_n = a_1 \times r^{n-1}$$

Speed formulae:

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

Acceleration:

$$a = \frac{\Delta v}{t} \quad v = u + at$$

Geometry

Sum of interior angles:

$$(n - 2) \times 180^\circ$$

Interior angle of regular polygon:

$$[(n - 2) \times 180^\circ] \div n$$

Exterior angle:

$$360^\circ \div n$$

Pythagoras' theorem:

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

Rectangle:

$$\text{Area} = l \times w \qquad \text{Perimeter} = 2(l + w)$$

Square:

$$\text{Area} = a^2 \qquad \text{Perimeter} = 4a$$

Parallelogram:

$$\text{Area} = b \times h$$

Trapezium:

$$\text{Area} = \frac{1}{2}(a + b) \times h$$

Triangle:

$$\text{Area} = \frac{1}{2} \times b \times h \qquad \text{or} \qquad \frac{1}{2}ab \sin(C)$$

Circle:

$$\text{Area} = \pi r^2 \qquad \text{Circumference} = 2\pi r$$

Mensuration

Cuboid:

$$\text{Volume} = l \times w \times h \qquad \text{Surface Area} = 2(lw + lh + wh)$$

Cube:

$$\text{Volume} = a^3 \qquad \text{Surface Area} = 6a^2$$

Cylinder:

$$\text{Curved SA} = 2\pi rh \qquad \text{Total SA} = 2\pi rh + 2\pi r^2 \qquad \text{Volume} = \pi r^2 h$$

Cone:

$$\text{Curved SA} = \pi r l$$

$$\text{Total SA} = \pi r l + \pi r^2$$

$$\text{Volume} = \frac{1}{3}\pi r^2 h$$

Sphere:

$$\text{SA} = 4\pi r^2$$

$$\text{Volume} = \frac{4}{3}\pi r^3$$

Prism:

$$\text{Volume} = \text{base area} \times \text{height}$$

Pyramid:

$$\text{Volume} = \frac{1}{3} \times \text{base area} \times h$$

Sector Area:

$$\frac{\theta}{360} \pi r^2 \text{ (Degrees)} \quad \text{or} \quad \frac{1}{2} r^2 \theta \text{ (radians)}$$

Arc Length:

$$\frac{\theta}{360} \times 2\pi r \text{ (Degrees)} \quad \text{or} \quad r\theta \text{ (radians)}$$

Trigonometry

Basic ratios:

$$\sin(\theta) = \text{opposite} \div \text{hypotenuse}$$

$$\cos(\theta) = \text{adjacent} \div \text{hypotenuse}$$

$$\tan(\theta) = \text{opposite} \div \text{adjacent}$$

Radians:

$$180^\circ = \pi \text{ radians}$$

$$1^\circ = \frac{\pi}{180} \text{ radians}$$

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 triangle:

$$\frac{1}{2}ab \sin(C)$$

Statistics

Mean (ungrouped):

$$\bar{x} = \Sigma x \div n$$

Mean (grouped):

$$\bar{x} \approx \frac{\Sigma(f \times m)}{\Sigma f}$$

Range:

$$\text{max} - \text{min}$$

Interquartile Range:

$$Q_3 - Q_1$$

Frequency Density:

$$\text{Frequency} \div \text{Class Width}$$

Probability

Complement:

$$P(A') = 1 - P(A)$$

Addition Rule:

$$P(A \cup B) = P(A) + P(B) - P(A \cap B)$$

Independent Events:

$$P(A \cap B) = P(A) \times P(B)$$

Expected Value:

$$E(X) = \sum x \cdot P(x)$$

Prepared by: Maria Mehmood

mymathsclub.com