Standard form:

$a \times 10^n$

- Where a one digit.
- And n +ve ←
  -ve →

Simple Interest:

$I = \frac{R}{1}$

Where I : Interest.
P: Amount of Money.
T: Time Yearly.
R: Rate.

Compound Interest:

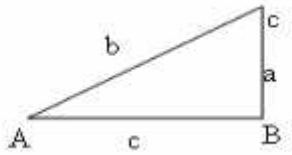
$T = P(1+R/100)^n$

T: Total Amount of Money.
P: Amount of Money.
R: Rate.
n: Time Yearly.

Shape	Area	Perimeter
Rec	L x W	2(L + W)
Square	L x W	4 L
Parallel	B x h	Sum of side
Trap	1/2 (a + b)h	Sum of side
Kite	1/2 D_1 x D_2	Sum of side
Triangle	1/2 B x h 1/2 a x b x sin t	Sum of side
Circle	Π r^2	2π r

In a right angle triangle

- SOH/ CAH/ TOA
- $b^2 = a^2 + c^2$ (Pythagoras Therom)



Parallel lines

- Two alternate equal angles.
- Two corresponding equal angles.
- Two interior angles are equal to 180.

In Circle

- radius ⊥ tangent
- 2 circular angle equal
- Central angle = 2 circles
- 2 tangent are equal
- Angle opposite Diameter = 90°

- In cyclic opposite angle = 180°
- Arc length = $\frac{G}{3} \ x \ 2\pi r$
- Sector area = $\frac{G}{3} \ x \ \pi r^2$

Volume = A x h
A = Base area.

Sum of interior = (n-2)180
Each angle in regular = $\frac{(n-2)1}{n}$
Sum of exterior = 360°

In similarity

- Angles equal
- Sides proportional (equal ratio)
- $\frac{A_1}{A_2} = (\frac{S_1}{S_2})^2$
- $\frac{V_1}{V_2} = (\frac{S_1}{S_2})^3$

Direct Variation

$x \propto y \longrightarrow x = k\,y$

Inversely Variation

$x \propto \frac{1}{y} \longrightarrow x = \frac{k}{y}$

Indices

$a^n \times a^m = a^{n+m}$
$a^n \div a^m = a^{n-m}$
$(a^n)^m = a^{nm}$
$\sqrt[n]{a^m} = a^{\frac{m}{n}}$
$a^z = 1$
$a^{-1} = \frac{1}{a}$

Inequality

$-x < y \longrightarrow x > -y$

Linear programming

- Shade unrequired region after:-
- Turn inequality ⟶ equation. (make y subject)
- Draw equation of (straight line).
- Shade over or under the line.

Bearing:

Angle measured

- From
- North
- Clock Wise

Sine rule:

Given angle & opposite side

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

Cosine rule:

Given 3 sides or 2 sides and angle in bet.

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

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

Limits of Accuracy:

nearest ⟶ ☐ ÷ 2 ⟶ result ±

Quadratic Equation:

Correct to 2 decimal place use

$X = \frac{-b \pm \sqrt{b^2 - 4a}}{2a}$ where $ax^2 + bx + c = 0$

Gradient:

- Line touches the curve at point
- Tan angle.
- Diff of y / diff of x

Equation of straight line ⟶ $y = mx + c$

Where m = gradient , c = y intercept

Graphical soln:

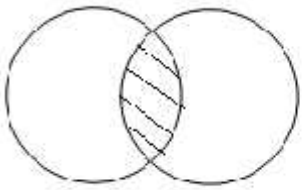
- Point of intersection of curve with x axis or line
- Line cut x axis ⟶ y = 0
- Line cut y axis ⟶ x = 0

In a speed time graph:

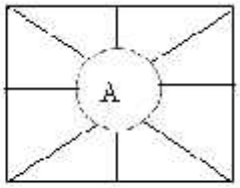
Distance = Area under graph.

Acceleration = $\frac{cha \quad o \ s}{cha \quad o \ ti}$

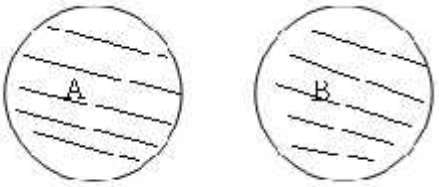
Sets:



A ∩ B
1 ∈ A
1 ∉ B



Ā complement
not A
A ⊂ δ
B ⊄ ε



A ∪ B
all element

In Vector:

- If you want resultant you must start with point and end by the other.
  For example: $\overrightarrow{A} = \overrightarrow{A} + \overrightarrow{C} + \overrightarrow{D}$

Column Vector:

$\binom{3}{2} = \overrightarrow{A}$

Start with A 3 unit in +ve x
Then 2 unit in +ve y

Parallel Vector:

$k\binom{a}{b} \;//\; \binom{a}{b}$

Modulus Vector:

• Length • magnitude

If $\vec{a} = \binom{x}{y} \longrightarrow |a| = \sqrt{x^2 + y^2}$

Function:

- To get the inverse make x subject.
- Composed function substitute x by function.

Matrix:

Order R x C
M_1 x M_2
For multiply R_1 x C_1 R_2 x C_2
Condition $C_1 = R_2$

Inverse of matrix:

$A = \begin{pmatrix} a & b \\ c & d \end{pmatrix}$

$A^{-1} = \frac{1}{a \quad -b} \begin{pmatrix} d & -b \\ -c & a \end{pmatrix}$

$AA^{-1} = I \begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$

I ⟶ Identity

Transformation:

G1 the size not change

- Reflection ⟶ Distance from O to Mir = Distance from I to Mir
  ⟶ OI ⊥ Mir
- Rotation ⟶ center (⊥ Bisector of O & I)
  ⟶ Angle of rotation
  ⟶ Direction
- Translation ⟶ $\begin{pmatrix} x \\ y \end{pmatrix}$ column vector

G2 the size changed (scale factor)

Enlargement

- Scale factor
- Center fenelayment

Scale Factor = $\frac{l_{\cdot} \quad ht\,o \quad I}{l_{\cdot} \quad h\,o \quad o}$

Shear

- Scale factor
- Invariant line

Scale Factor = $\frac{D \quad o \quad I\,m}{\perp d \quad o \quad o\,f \quad I_{\cdot}}$

Stretch

- Scale factor
- Invariant line

Scale Factor = $\frac{\perp d \quad o \quad I\,f \quad I_{\cdot}}{\perp d \quad o \quad o\,f \quad I_{\cdot}}$

Statistics

- If histogram f.d = $\frac{f}{c \quad w \quad h}$
- If pie chart total frequency ≡ 360°

Data

Ungrouped	grouped
Mean ≡ $\frac{si \quad o \quad a}{the \quad n}$	$\frac{\Sigma f}{\Sigma f}$ Middle class
Median Middle after arrange	$f/_2$ and add till you get
Mode Most repeated	highest frequency class

In cumulative frequency curve:

Median = 50% of frequency
Upper quartile = 75% of frequency
Lower quartile = 25% of frequency
Inter quartile = upper – lower

Probability

$$0 \leq P \leq 1$$

$$P = \frac{n \quad o \quad e}{a \quad e}$$

Sum of all probability = 1
For 2 events A & B
P (A and B) = P (A) x P (B)
P (A or B) = P (A) + P (B)

If we have 2 points A (x_1, y_1) B(x_2, y_2)

A B

Length of $\overline{A}$ = $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
Mid-point = ($\frac{x_1+x_2}{2}$, $\frac{y_1+y_2}{2}$)
Grad = $\frac{y_2-y_1}{x_2-x_1}$