

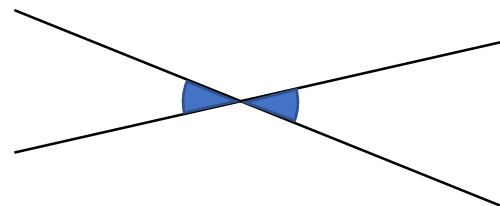
Equivalence between miles and kilometres

$$8\text{km} \approx 5 \text{ miles}$$

Fraction, decimal and percentage equivalents	Fraction	Decimal	Percentage
	$\frac{1}{2}$	0.5	50
	$\frac{1}{3}$	$0.\dot{3}$	$33.\dot{3}$
	$\frac{1}{4}$	0.25	25
	$\frac{1}{5}$	0.2	20
	$\frac{1}{8}$	0.125	12.5
	$\frac{1}{10}$	0.1	10

Vertically opposite angles

Vertically opposite angles are equal



Area of a triangle

$$\text{Area of a triangle} = \text{base} \times \text{height} \div 2$$

Area of a parallelogram

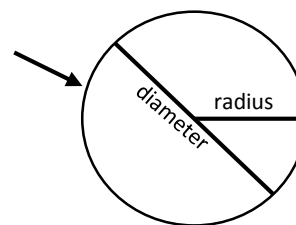
$$\text{Area of a parallelogram} = \text{base} \times \text{height}$$

Units for volume

cubes

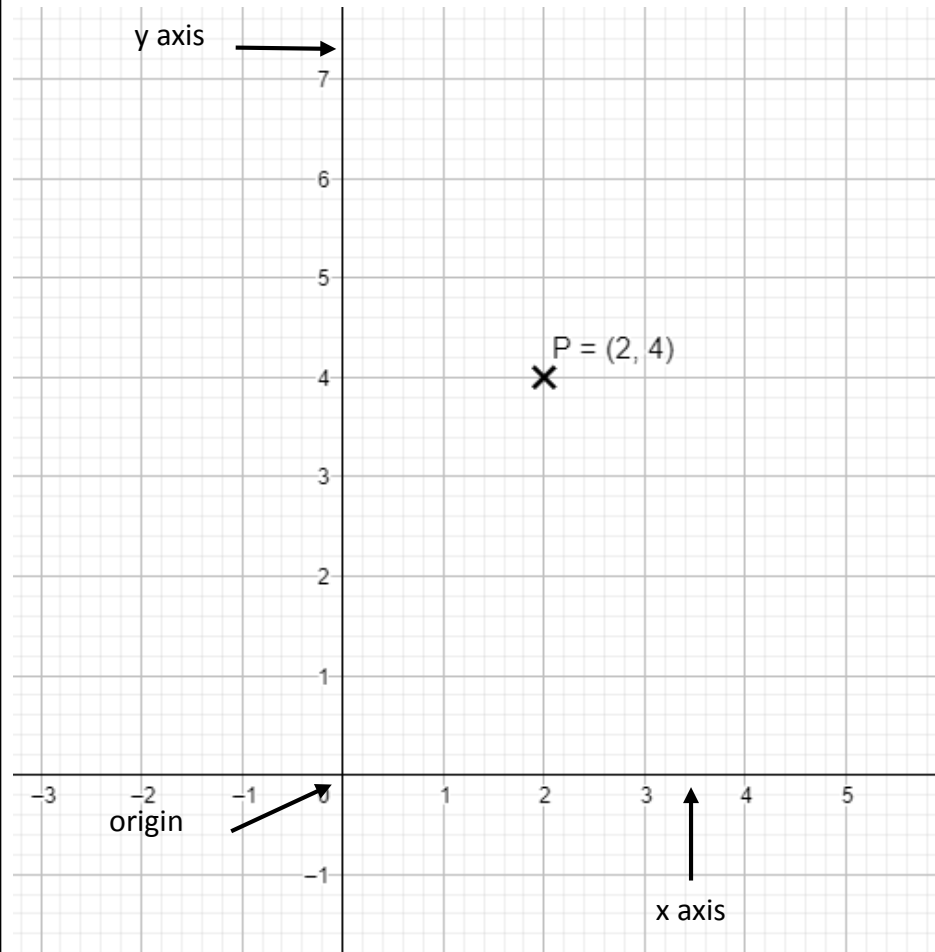
Parts of a circle

circumference



$$\text{Diameter} = 2 \times \text{radius}$$

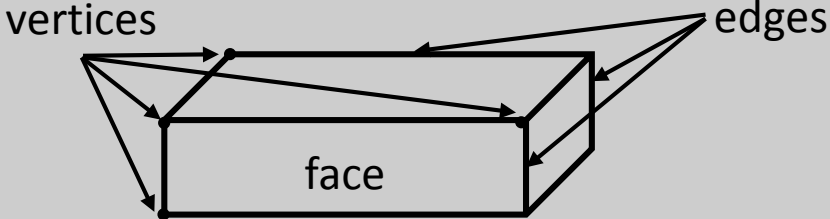
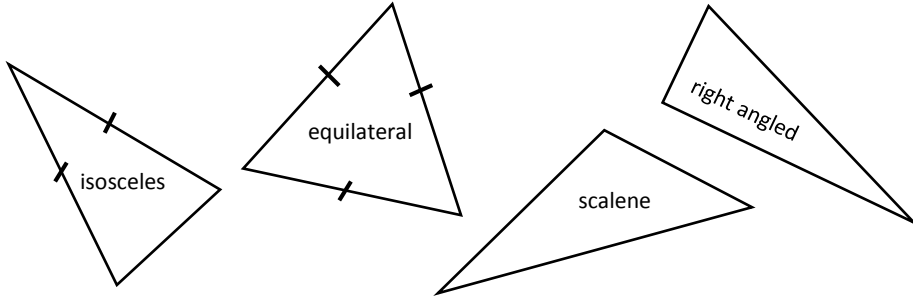
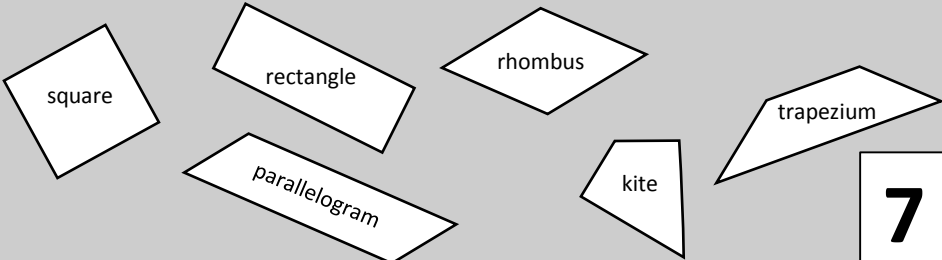
Coordinate grids



Mean

Mean = sum of data \div number of pieces of data

The first 6 cube numbers	1, 8, 27, 64, 125, 216...	
The first 12 triangular numbers	1, 3, 6, 10, 15, 21, 28, 36, 45, 55, 66, 78...	
Mathematical symbols	=	is equal to
	≠	is not equal to
	<	is less than
	>	is greater than
	≤	is less than or equal to
	≥	is greater than or equal to
Order of operations	Brackets Indices Division & Multiplication Addition & Subtraction	
Algebraic notation	$a + a$	$2a$
	$a \times a$	a^2
	$1a$	a
	$a \times b$	ab
	$a \div b$	$\frac{a}{b}$

Area of a rectangle	length x width
Area of a triangle	$\frac{base \times height}{2}$
Area of a parallelogram	$base \times height$
Area of a trapezium	$\frac{(a + b) \times h}{2}$
Volume of a cuboid	Area of one face x length
3D solids language	
Special triangles	
Special quadrilaterals	

Mean

Sum of all data values \div number of data values

Mode

Most frequent value

Median

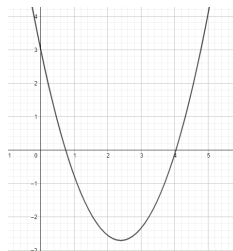
Middle value when data is put in order

Range

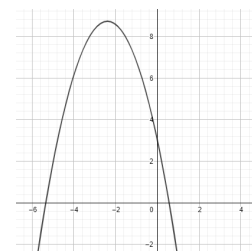
Highest value – lowest value

A product of prime factors	$420 = 2 \times 2 \times 3 \times 5 \times 7$		
Significant figures	3 2 4 9 1 1st 2nd 3rd 4th 5th	0. 0 0 3 2 4 9 1 1st 2nd 3rd 4th 5th	
Order of operations	Brackets Indices Division & Multiplication Addition & Subtraction		
Zero power	$a^0 = 1$		
Fraction, decimal, percentage equivalents	Fraction	Decimal	Percentage
	$\frac{1}{3}$	0. $\dot{3}$	33. $\dot{3}$
	$\frac{1}{5}$	0.2	20
	$\frac{1}{8}$	0.125	12.5
	$\frac{1}{10}$	0.1	10
Bearings	Measure from North, clockwise, three figures		8

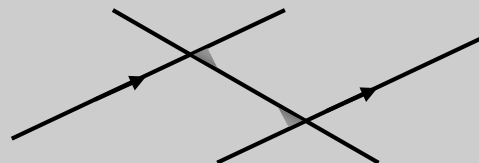
Graph of a quadratic function



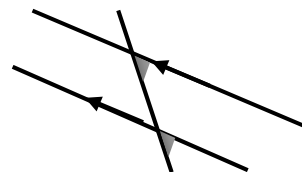
or



Alternate angles



Corresponding angles



Exterior angle sum of any polygon

360°

Interior angle sum of regular polygons

Triangle

180°

Quadrilateral

360°

Pentagon

540°

Hexagon

720°

Heptagon

900°

Octagon

1080°

Nonagon

1260°

Decagon

1440°

Circumference of a circle

$$C = \pi d \text{ or } C = 2\pi r$$

Area of a circle

$$A = \pi r^2$$

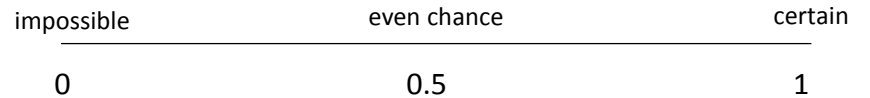
Volume of a prism

$$V = \text{area of cross-section} \times \text{length}$$

Mean of a set of grouped data

Data	Frequency	Mid interval value	Sub-total Freq x mid- value
$2 < t \leq 6$	3	4	12
$6 < t \leq 10$	2	8	16
$10 < t \leq 12$	5	11	55
$12 < t \leq 20$	2	16	32
Total	12		115
Estimated mean = $\frac{\text{Grand total}}{\text{Total frequency}} = \frac{115}{12} \approx 9.58$			

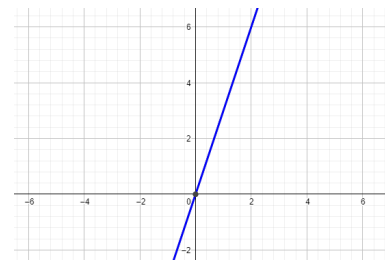
Probability scale



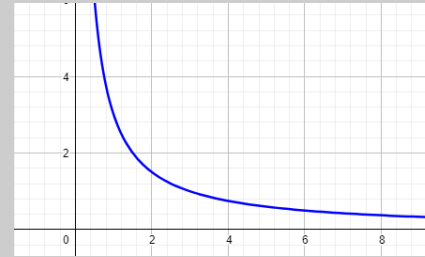
Sum of all probabilities

Sum of all probabilities = 1
for a single event

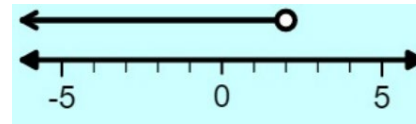
Direct proportion



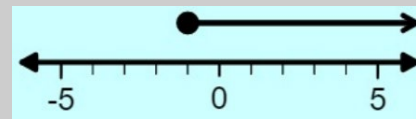
Indirect proportion



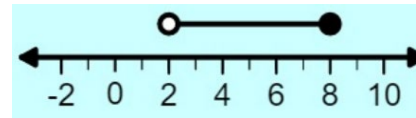
$$x < 2$$



$$x \geq -1$$



$$2 < x \leq 8$$



Formula for speed

$$\text{Speed} = \frac{\text{change in distance}}{\text{change in time}}$$

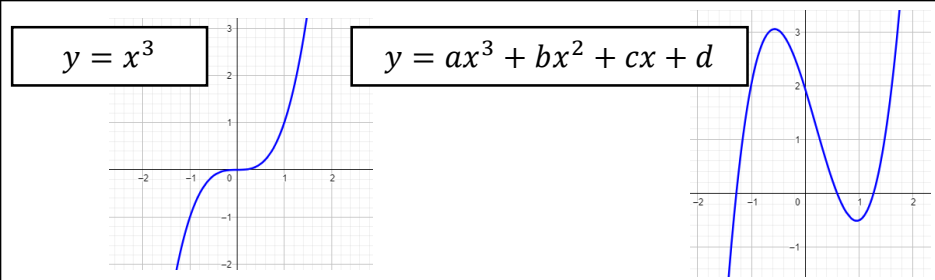
Formula for density

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

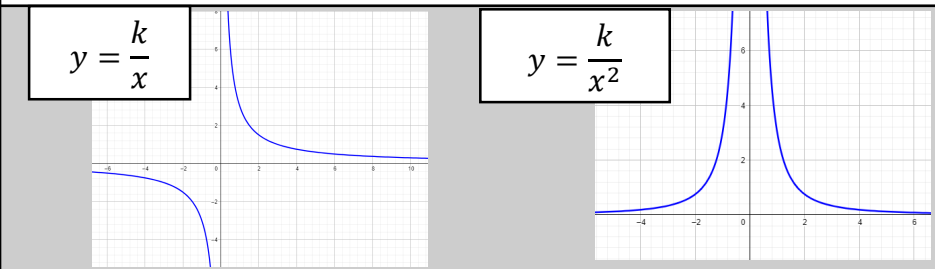
Formula for pressure

$$\text{Pressure} = \frac{\text{force}}{\text{area}}$$

Graphs of a cubic functions
 $y = x^3$ and $y = ax^3 + bx^2 + cx + d$



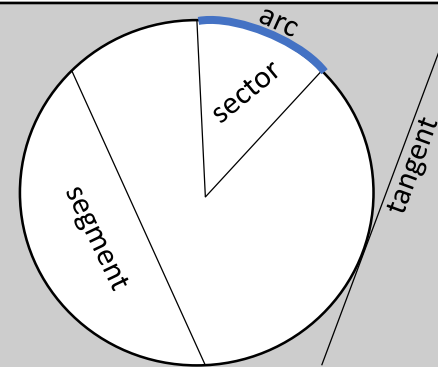
Graphs of reciprocal functions
 $y = \frac{k}{x}$ and $y = \frac{k}{x^2}$



Pythagoras' theorem

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

Parts of a circle



Conditions for congruent triangles

RHS
 SSS
 SAS
 ASA

Fractions and equivalent recurring decimals

$$\frac{1}{9} = 0.\dot{1} ; \frac{1}{3} = 0.\dot{3} ; \frac{2}{3} = 0.\dot{6} ; \frac{1}{6} = 0.1\dot{6}$$

Fractional index law

$$a^{\frac{1}{n}} = \sqrt[n]{a}$$

Negative index law

$$a^{-n} = \frac{1}{a^n}$$

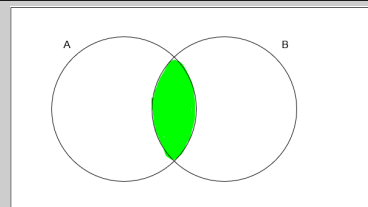
Direct proportion

$$y = kx ; y = kx^2 ; y = k\sqrt{x}$$

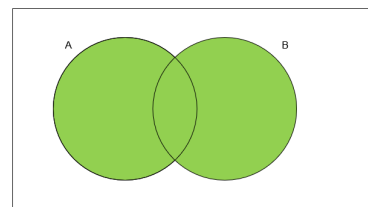
Inverse proportion

$$y = \frac{k}{x} ; y = \frac{k}{x^2} ; y = \frac{k}{\sqrt{x}}$$

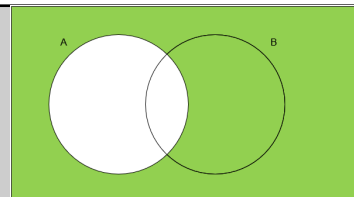
$A \cap B$



$A \cup B$



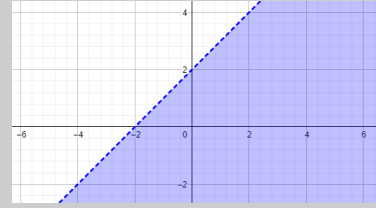
A'



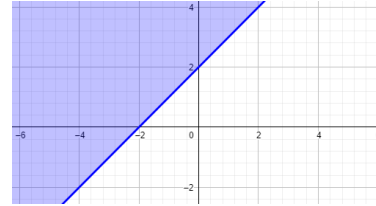
Difference of two squares

$$a^2 - b^2 \equiv (a - b)(a + b)$$

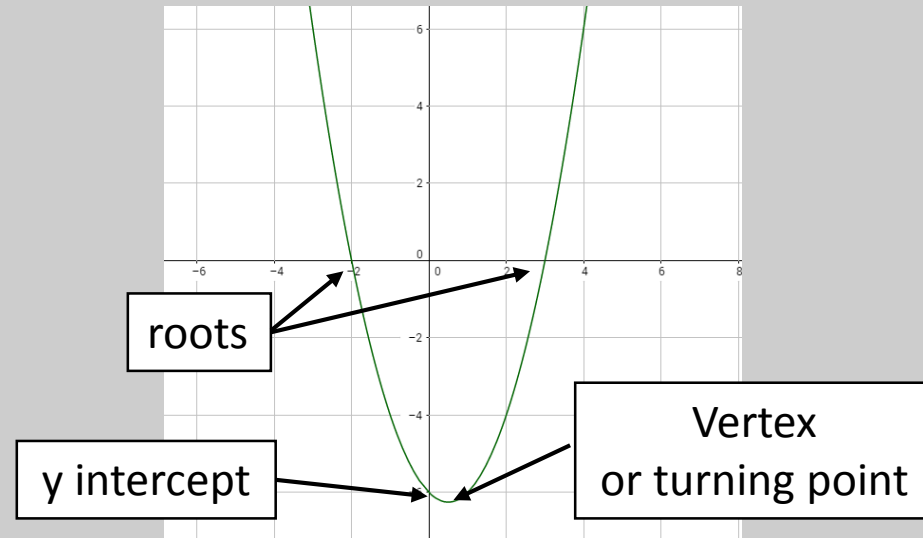
$$y < x + 2$$



$$y \geq x + 2$$



Features of a quadratic



Gradients of a perpendicular lines

$$m_1 \times m_2 = -1$$

m_1 is the negative reciprocal of m_2

Acceleration

$$Acceleration = \frac{\text{change in velocity}}{\text{change in time}}$$

Right angled trig ratios

$$\sin x = \frac{o}{h}; \cos x = \frac{a}{h}; \tan x = \frac{o}{a}$$

Exact trig values

	30	45	60
sin	$\frac{1}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{\sqrt{3}}{2}$
cos	$\frac{\sqrt{3}}{2}$	$\frac{1}{\sqrt{2}}$	$\frac{1}{2}$
tan	$\frac{1}{\sqrt{3}}$	1	$\sqrt{3}$

Volume of a sphere

$$V = \frac{4}{3}\pi r^3$$

Volume of a cone

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

Volume of a pyramid

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

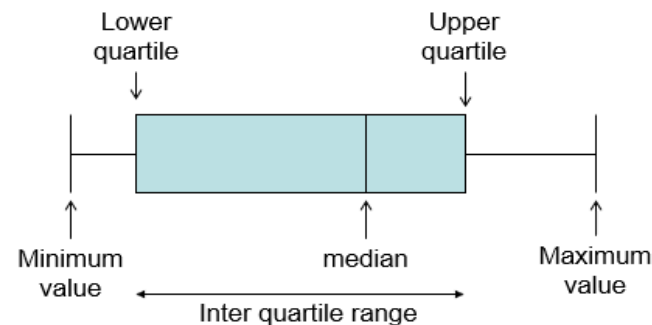
Surface area of a sphere

$$S.A. = 4\pi r^2$$

Surface area of a cone

$$S.A. = \pi r^2 + \pi r l$$

Features of a box plot



To describe a reflection you need...	Equation of mirror line
To describe a rotation you need...	Angle; direction; centre of rotation
To describe a translation you need...	A vector
To describe an enlargement you need...	Scale factor; centre of enlargement
8 Circle theorems	<ul style="list-style-type: none"> • Angles in a semicircle are 90°. • Angle at the centre is double the angle at the circumference. • Angles in the same segment are equal. • The perpendicular bisector of a chord goes through the centre of a circle. • A radius and a tangent meet at 90°. • Tangents to a circle from the same point are equal in length. • Opposite angles in a cyclic quadrilateral sum to 180°. • Alternate segment theorem (angle between a tangent and a chord is equal to the angle in the alternate segment).