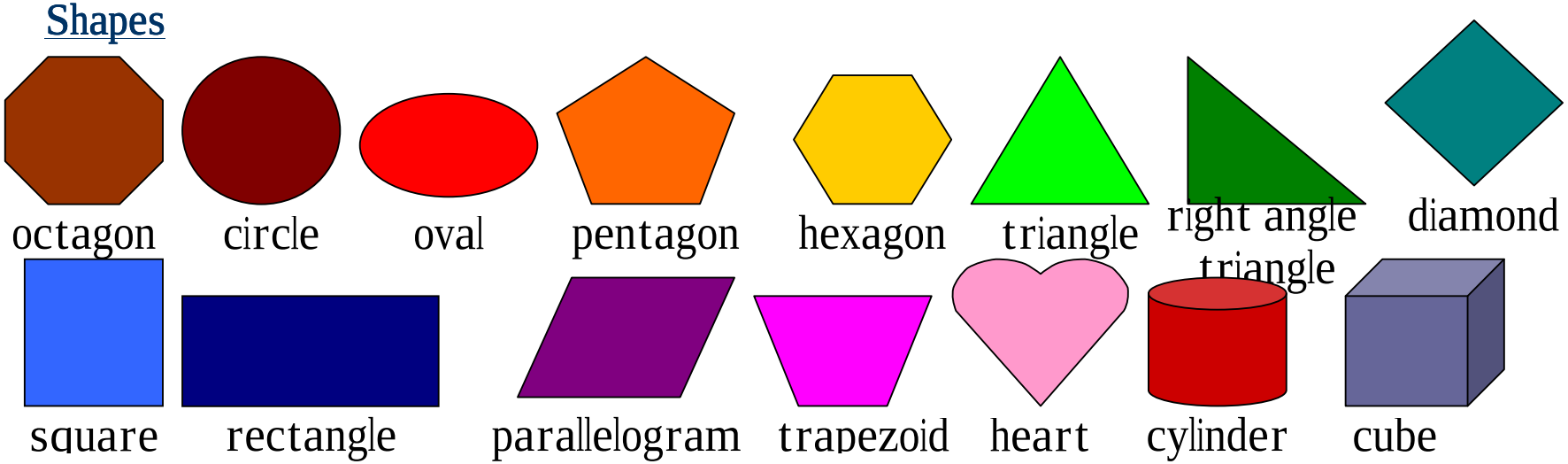
Multiplication Table

x	1	2	3	4	5	6	7	8	9	10	11	12
1	1	2	3	4	5	6	7	8	9	10	11	12
2	2	4	6	8	10	12	14	16	18	20	22	24
3	3	6	9	12	15	18	21	24	27	30	33	36
4	4	8	12	16	20	24	28	32	36	40	44	48
5	5	10	15	20	25	30	35	40	45	50	55	60
6	6	12	18	24	30	36	42	48	54	60	66	72
7	7	14	21	28	35	42	49	56	63	70	77	84
8	8	16	24	32	40	48	56	64	72	80	88	96
9	9	18	27	36	45	54	63	72	81	90	99	108
10	10	20	30	40	50	60	70	80	90	100	110	120
11	11	22	33	44	55	66	77	88	99	110	121	132
12	12	24	36	48	60	72	84	96	108	120	132	144

Shapes



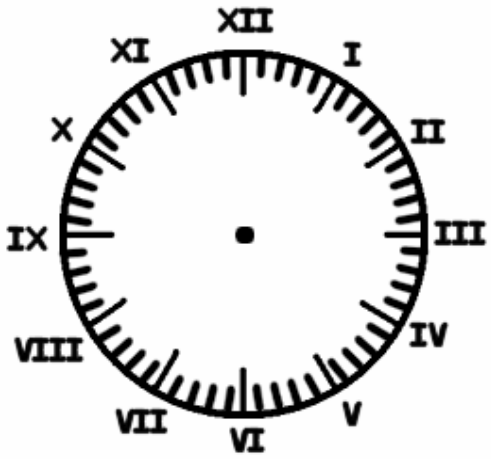
									
1	2	3	4	5	6	7	8	9	10

Number Chart

1	2	3	4	5	6	7	8	9	10
1	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100
101	102	103	104	105	106	107	108	109	110

10	ten
20	twenty
30	thirty
40	forty
50	fifty
60	sixty
70	seventy
80	eighty
90	ninety
100	hundred
1000	thousand

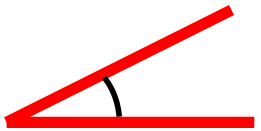
Roman Numbers



1= I
2= II
3= III
4= IV
5= V
6= VI
7= VII
8= VIII
9= IX
10= X
15= XV
20= XX
40= XL
50= L
90= XC
100= C
500= D
1000= M

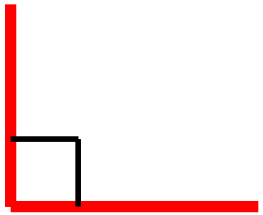
Angles

straight line



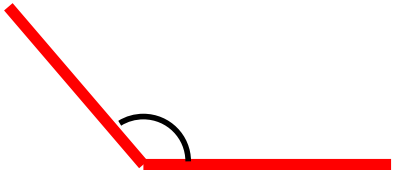
acute angle

angle less than 90°



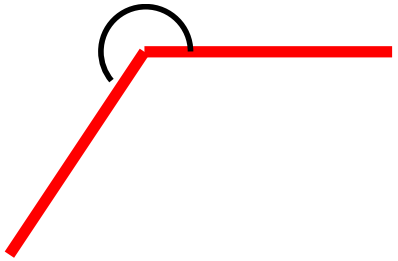
right angle

angle of 90°



obtuse angle

angle greater than 90°



reflex angle

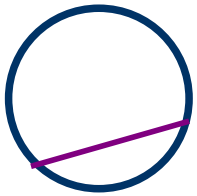
angle more than 180° but less than 360°

==========

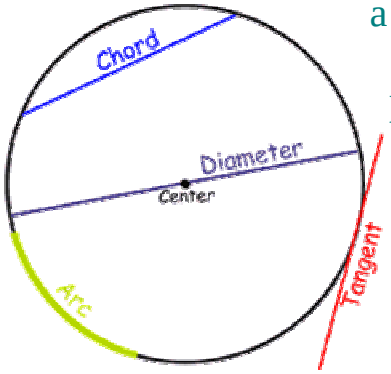
parallel lines

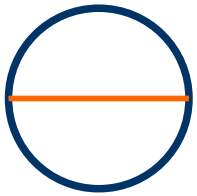
2 straight lines remain that same distance apart

Circles

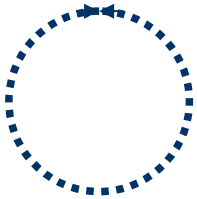


Chord
a straight line joining 2 points on the circumference of the circle

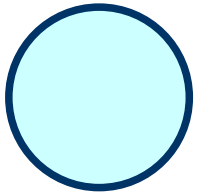




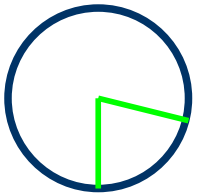
Diameter
a straight line joining 2 points on a circle & passing through the centre of the circle



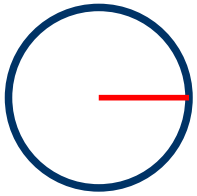
Circumference of a circle
$2\pi r$



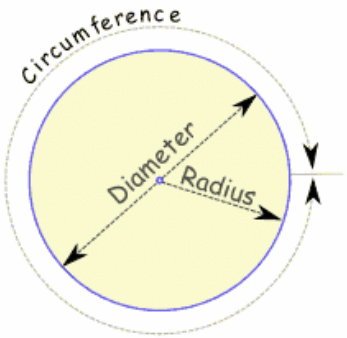
Area of a circle
πr^2



Sector
an area of a circle bound by circumference of the circle and the radii of a circle, drawn to the end points of an arch



Radius
a straight line from the centre of the circle to the circumference

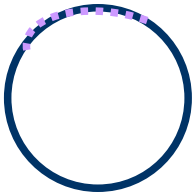


$\frac{\text{Circumference}}{\text{Diameter}} = \pi = 3.14159...$

Outer area of a Sphere (ball)
$4\pi r^2$

$\pi = \pm 22/7$

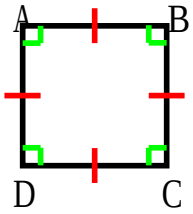
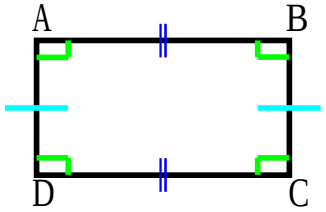
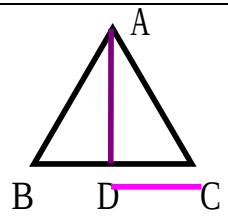
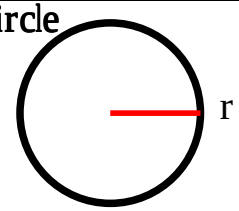
$\pi = 3.14159$

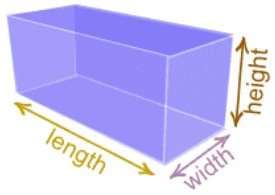
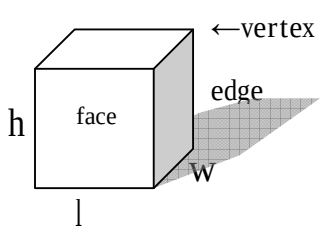
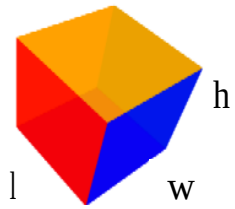


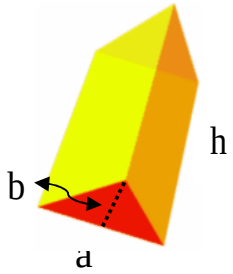
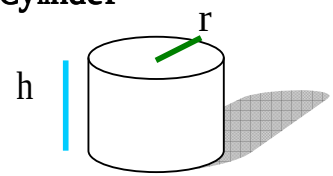
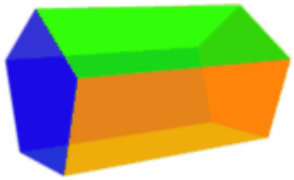
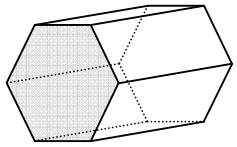
Arch
a portion of the circumference of the circle

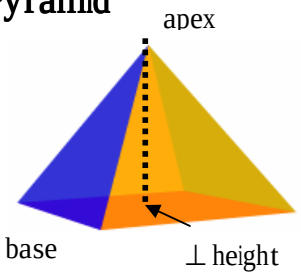
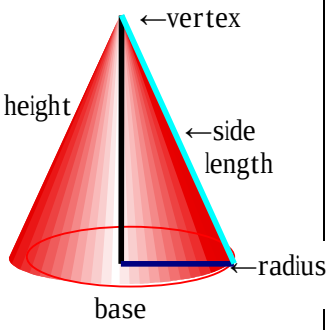
Circles = 360°

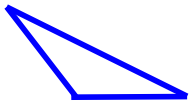
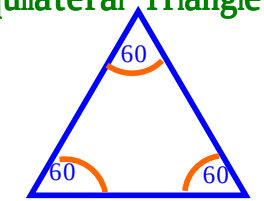
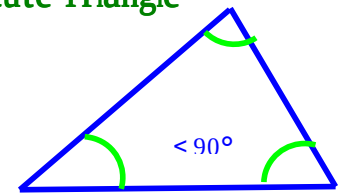
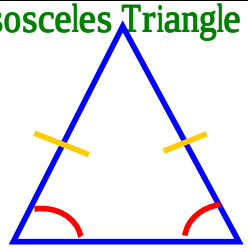
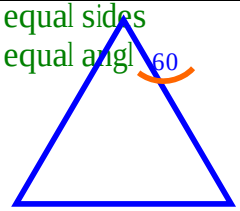
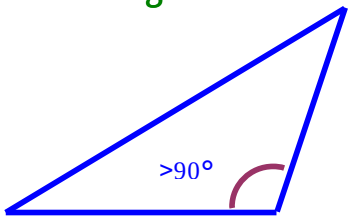
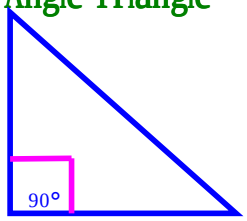
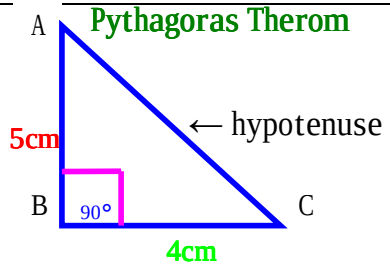
Semi-circle = 180°

2D Shapes	Shape	Circumference	Area
Square 	• 4 equal sides • all angles 90°	AB +BC + CD + DA or 4(AB)	length x width or DC x AD = cm^2 / m^2
Rectangle 	• opposite sides equal • all angles 90°	AB +BC + CD + DA or 2(AB) + 2 (BC)	length x width or DC x AD = cm^2 / m^2
Triangle 	• 3 sides • 3 interior angles = 180° • perpendicular height AD	AB + BC + CA	Area = ½ base x perpendicular height ½BC. AD or DC.AD
Circle 	Round 2D shape with radius from centre to outside edge	$2\pi r$ = 2. (3.14159) . radius	πr^2 = 3.14159 x (radius)²

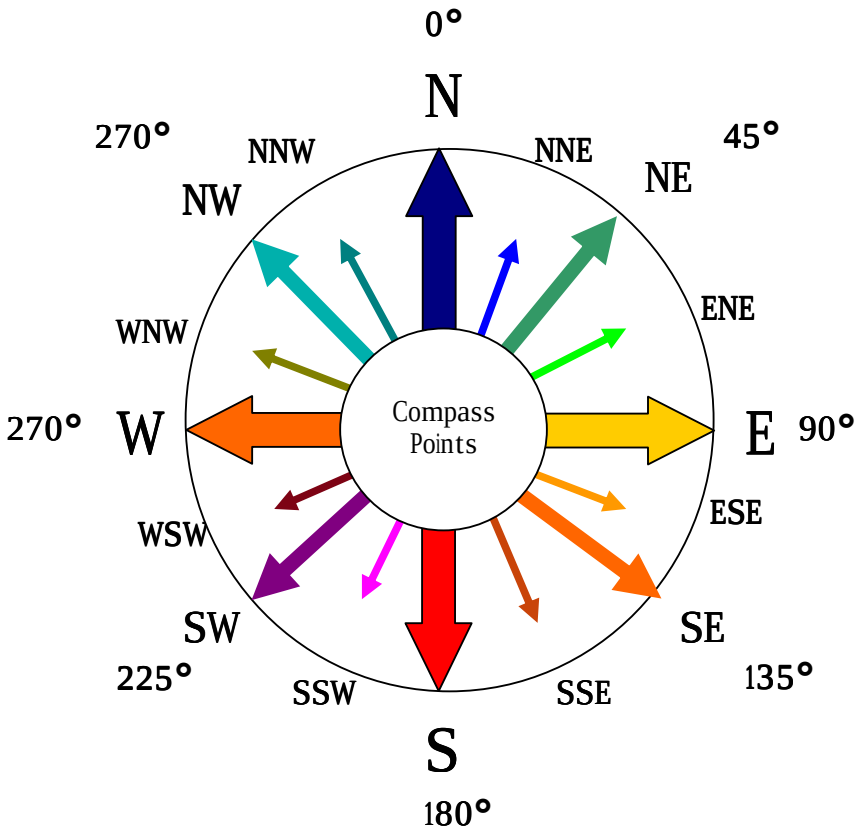
3D Shapes	Shape	Volume	Outer Area
Prism 	A solid object that has two identical ends and all **flat** sides The cross section is the same all along its length The shape of the ends give the prism a name such as "triangular prism" It is a polyhedron	The content the shape can hold inside its sides Volume = height x width x length	The area of the outer surfaces Area = 2wl + 2lh + 2hw
Cube 	• Cube has 6 sides called faces • Each face has 4 edges, and is a square • It has 12 Edges • It has 8 Vertices (corner points) • At each vertex 3 edges meet	Area base x height = (length x width) x h = (ax a) x a = a^3	Sum of areas of 6 squares = 6 (l x w) = 6 (a x a) = $6.a^2$
Cuboid Prism 	• 2 square bases • 4 square sides	Area of base x height = (length x width) x h	Sum of all 6 sides = 2 (l x b) + 2 (l x h) + 2 (b x h)

3D Shapes	Shape	Volume	Outer Area
Triangluar Prism 	• 2 triangle bases • 3 rectangle sides	Area of triangle x height = ½ (a x b) x h	2 triangles + 3 plane rectangle sides = 2 (½(a.b).h) + 3 (a.h)
Cylinder 	• 2 identical flat circular or elliptical ends • 1 curved side that opens as a rectangle	Area of circle base x height = (πr^2) x h	Sum of areas of 2 circles + arched level = 2 (πr^2) + ($2\pi rh$)
Pentagon Prism 	• 2 flat pentagons (5-sided polygon) • 5 rectangular sides • Not all pentagons sides are equal!	Area of base x height	Sum of areas of 2 pentagons + 5 rectangles
Hexagonal Prism 	• 2 hexagon bases with 6 sides • 6 rectangular sides	Area of base x height	Sum of areas of 2 pentagons + 6 rectangles

3D Shapes	Shape	Volume	Outer Area
Pyramid 	• The base is a polygon (a straight-sided shape) • The sides are triangles which meet at the top (apex). • This is a square pyramid, but there are also triangular pyramids, pentagonal pyramids, and so on.	⅓ x area of base x per pendicular height(⊥) of triangle	$^1/_2$ × Perimeter × Side Length + Base Area
Sphere 	• A 3-dimensional object shaped like a ball • Every point on the surface is the same dist ance from the center	Volume $= (4/3) \times \pi \times r^3$	Surface Area $= 4 \times \pi \times r^2$
Cone 	• A solid object that has a flat circular base, a curved surface and one vertex (point)	Volume ⅓ x area of base x perpendicular height **or** Volume $= \pi \times r^2 \times (h/3)$	Surface Area of **Base** $= \pi \times r^2$ **+** Surface Area of **Side** $= \pi \times r \times s$ **or** Surface Area of **Side** $= \pi \times r \times \sqrt{(r^2 + h^2)}$

Triangles	All triangles have 3 sides All triangle have 3 angles The 3 angles add up to 180°	**Scalene Triangle** 	**No** equal sides **No** equal angles
Equilateral Triangle 	**Three** equal sides **Three** equal angles = 60°	**Acute Triangle** 	All angles are less than 90°
Isosceles Triangle 	**Two** equal sides **Two** equal angl 	**Obtuse Triangle** 	Has an angle more than 90°
Right Angle Triangle 	Has a **right** angle (90°)	**Pythagoras Therom** 	In a right angled triangle the square of the long side (the "hypotenuse") is equal to the sum of the squares of the other two sides. $\therefore AC^2 = AB^2 + BC^2$ Calculate Hypotenuse = $\sqrt{(5)^2 + (4)^2}$ $\therefore AC = \sqrt{25 + 16}$ $AC = \sqrt{41}$ AC = 6,4cm

Maths Symbols and their meanings			
=	is equal to	≠	is not equal to
≈	is approximately	≡	is equivalent to
→	maps to	∴	therefore
//	parallel	⊥	perpendicular
>	is greater than	<	is less than
≥	is great than & equal to	≤	is less than & equal to
∟	90° / right angle	√	square root
∞	infinity	π	Pi
∵	because	°	degrees
$(a)^2$	(a) squared = a x a	≅	congruent
mℓ	millilitre / 0,0001 = 10^{-3}	ℓ	litre / 1000mℓ = 10^3
M	1 million = 10^6	c	centi 0.01 = 10^{-2}



Time	Temperature	Contents	Speed
1 day = 24 hours	°C = degrees Celcius	$1000mm^3 = 1cm^3 = 1cm$	km per hour = km/h
1 hour = 60 min	°F = degrees Fahrenheit	$1000cm^3 = 1d\ell^3 = 1\ell$itre	m per sec = m/s
1 min = 60 sec	To change F to C :	$1m^3$ = 1 kilolitre	
1 year = 12 months	**F = 9/5 C + 32**		**Distance**
1 month = 30 days			km ÷ 1000 = m
1 week = 7 days			m x 1000 = km
1 lunar month = 28 days			

Number Systems		
N	Natural numbers	N = {1; 2; 3; ...)
N_0	Whole numbers	N_0 = {0; 1; 2; 3; ...)
Q	Rational numbers	Q = {b} integer {c} non-zero integer
Q'	number cannot be written	
R	Real number	R = { rational + irrational numbers}
R'	Non- Real number	R' = do not exsist e.g.: $\sqrt{2}$
Z	Integer	Z = { ... -2; -1; 0; 1; 2; 3; ...}

Percent	Decimal	Fraction
1%	0.01	$^{1}/_{100}$
5%	0.05	$^{1}/_{20}$
10%	0.1	$^{1}/_{10}$
12 %	0.125	$^{1}/_{8}$
20%	0.2	$^{1}/_{5}$
25%	0.25	$^{1}/_{4}$
$33^{1}/_{3}$%	0.333...	$^{1}/_{3}$
50%	0.5	$^{1}/_{2}$
75%	0.75	$^{3}/_{4}$
80%	0.8	$^{4}/_{5}$
90%	0.9	$^{9}/_{10}$
99%	0.99	$^{99}/_{100}$
100%	1	
125%	1.25	$^{5}/_{4}$
150%	1.5	$^{3}/_{2}$
200%	2	

Different Types of Fractions	
0, 2412	Decimal fraction
$0{,}123^{\cdot}$	Recurring decimal fraction
½ small number over big number	Proper fraction
2 ⅓ a whole number & fraction	Mixed fraction
53 < bigger 24 < smaller	Improper fraction
Converting Fractions	
convert ⅝ to decimal	5 ÷ 8 = 0,625
convert 0.75 to decimal	0.75 then 0,75 x 100 1 1 x 100 = 75 simplify = 3 100 4
Convert $^{3}/_{8}$ to percentage	First divide 3 by 8: 3 ÷ 8 = 0.375, Then multiply by 100: 0.375 x 100 = 37.5 Add the "%" sign: 37.5% ∴ $^{3}/_{8}$ = 37.5%
Convert 75% to fraction	75% = = 75 simplify = 3 100 4
Convert 11/4 to mixed fraction	11 ÷ 4 = 2 with 3 remaining = $2\,^{3}/_{4}$