

Formulas of 2-D and 3-D Figures

Lateral Area, Surface Area & Volume

P = perimeter of base
 B = area of base
 l = slant height

Rectangle: $A = bh$

Circle: $A = \pi r^2$

Triangle: $A = \frac{bh}{2}$

Trapezoid: $A = \frac{h(b_1 + b_2)}{2}$

Volume of a Prism: $V = Bh$

Volume of a Cylinder: $V = \pi r^2 H$

Volume of a Cone: $V = \frac{\pi r^2 H}{3}$

Volume of a Pyramid: $V = \frac{Bh}{3}$

Volume of a Sphere: $V = \frac{4\pi r^3}{3}$

Lateral Area of a Prism: $LA = PH$

Surface Area of a Prism: $SA = PH + 2B$

Lateral Area of a Cylinder: $LA = 2\pi rH$

Surface Area of a Cylinder: $SA = 2\pi rH + 2\pi r^2$

Lateral Area of a Pyramid: $LA = \frac{Pl}{2}$

Surface Area of a Pyramid: $SA = \frac{Pl}{2} + B$

Lateral Area of a Cone: $LA = \pi rl$

Surface Area of a Cone: $SA = \pi rl + \pi r^2$

Surface Area of a Sphere: $SA = 4\pi r^2$

Pythagorean Theorem

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

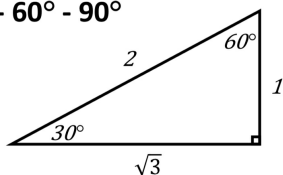
If $a^2 + b^2 = c^2$, then the triangle is **right**

If $a^2 + b^2 > c^2$, then the triangle is **acute**

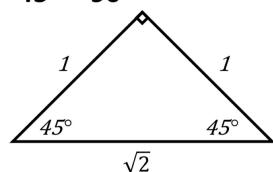
If $a^2 + b^2 < c^2$, then the triangle is **obtuse**

Special Right Triangles

30° - 60° - 90°



45° - 45° - 90°



Congruent Triangles

Valid SSS, SAS, ASA, AAS, & HL

NOT Valid SSA or the converse

HL only applies to right triangles

Equation of a Circle

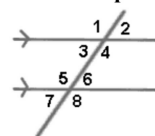
Circles:

Equation of circle center at origin:
 $x^2 + y^2 = r^2$ where r is the radius.

Equation of circle not at origin:
 $(x - h)^2 + (y - k)^2 = r^2$ where (h, k) is the center and r is the radius.

Parallel Lines cut by a Transversal

Parallels: If lines are parallel ...



Corresponding angles are equal.

$m\angle 1 = m\angle 5$, $m\angle 2 = m\angle 6$, $m\angle 3 = m\angle 7$, $m\angle 4 = m\angle 8$

Alternate Interior angles are equal.

$m\angle 3 = m\angle 6$, $m\angle 4 = m\angle 5$

Alternate Exterior angles are equal.

$m\angle 1 = m\angle 8$, $m\angle 2 = m\angle 7$

Same side interior angles are supp.

$m\angle 3 + m\angle 5 = 180$, $m\angle 4 + m\angle 6 = 180$

Polygon Interior/Exterior Angles

Sum of Int. Angles	$180(n - 2)$
Each Int. Angle Measure	$180(n - 2)/n$
Sum of Ext. Angles	360
Each Ext. Angle Measure	$360/n$

Conditionals

Conditional (Original)	if p , then q
Converse	If q , then p
Inverse	If not p , then not q
Contrapositive	If not q , then not p
Biconditional	p if and only if q

Arc Length and Sector Area

Arc Length $(M/360) \cdot 2\pi r$

Sector Area $(M/360) \cdot \pi r^2$

M = angle measure of sector

Coordinate Formulas

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

Midpoint of a line segment $(x_2 + x_1)/2, (y_2 + y_1)/2$

Slope Formula $(y_2 - y_1)/(x_2 - x_1)$

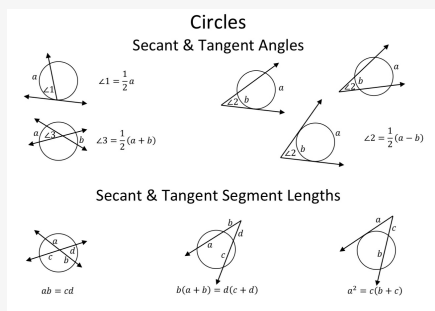


By RednBlueArtist
 (RednBlueArtist)

Published 13th May, 2025.
 Last updated 19th May, 2025.
 Page 1 of 2.

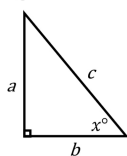
Sponsored by Readable.com
 Measure your website readability!
<https://readable.com>

Circles



Trigonometric Ratios

Trigonometric Ratios



$$\sin x^\circ = \frac{a}{c}$$

$$\cos x^\circ = \frac{b}{c}$$

$$\tan x^\circ = \frac{a}{b}$$

Triangle

Scalene	no congruent sides
Isosceles	2 congruent sides
Equilateral	3 sides congruent
Equiangular	3 congruent angles (60 degrees)
Acute	all acute angle
Right	one right angle
Obtuse	one obtuse angle

Equiangular = Equilateral

Exterior angle of a triangle equals the sum of the 2 non-adjacent interior angles

Mid-segment of a triangle is parallel to the third side and half the length of the third side

Transformation Rules

Type of Transformation	Change to Coordinate Point
Vertical translation up d units	$(x, y) \rightarrow (x, y + d)$
Vertical translation down d units	$(x, y) \rightarrow (x, y - d)$
Horizontal translation left c units	$(x, y) \rightarrow (x - c, y)$
Horizontal translation right c units	$(x, y) \rightarrow (x + c, y)$
Reflection over x-axis	$(x, y) \rightarrow (x, -y)$
Reflection over y-axis	$(x, y) \rightarrow (-x, y)$



By RednBlueArtist
(RednBlueArtist)

Published 13th May, 2025.
Last updated 19th May, 2025.
Page 2 of 2.

Sponsored by [Readable.com](https://readable.com)
Measure your website readability!
<https://readable.com>