

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

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

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

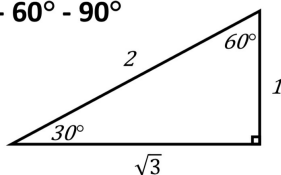
If $a^2 + b^2 = c^2$, then the triangle is **right**

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

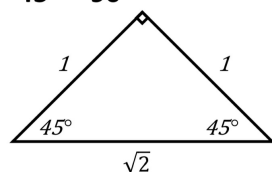
If $a^2 + b^2 < c^2$, then the triangle is **obtuse**

Special Right Triangles

30° - 60° - 90°



45° - 45° - 90°



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

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:

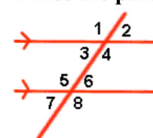
Equation of circle center at origin:
 $x^2 + y^2 = r^2$ where r is the radius.

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



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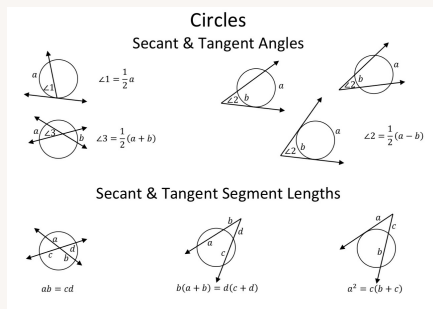
Page 1 of 2.

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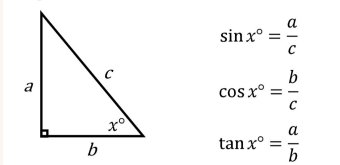
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Circles



Trigonometric Ratios

Trigonometric Ratios



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



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Page 2 of 2.

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