Area formulas

Circle = πr^2

Sphere = $4\pi r^2$

Hollow cylinder = $2\pi rh$

Ellipse = πab

Triangle = $(1/2)bh$

Rhombus = bh

Equilateral triangle = $\frac{S^2\sqrt{3}}{4}$

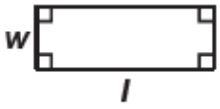
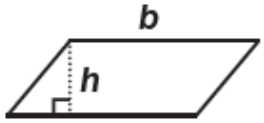
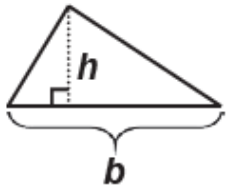
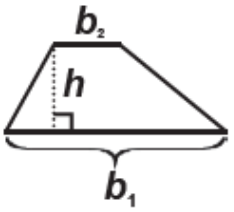
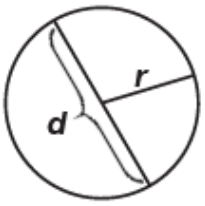
S= side of triangle

Area of a regular polygon = $(1/2) \cdot N \cdot \sin(360/N) \cdot S^2$

Sum of interior angles = $(N-2) \cdot 180$

N = number of sides, S=length from center to a corner

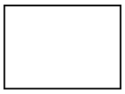
Area (*A*) and Circumference (*C*)

Name	Shape	Formula
Rectangle		$A = lw$
Parallelogram		$A = bh$
Triangle		$A = \frac{1}{2}bh$
Trapezoid		$A = \frac{1}{2}(b_1 + b_2)h$
Circle		$A = \pi r^2$ $C = 2\pi r$ $C = \pi d$

Formulas for Area (A), Circumference (C), and Arc Length (L)

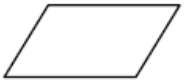
Area of a Triangle: $A = \frac{1}{2}bh$

Area of a Rectangle: $A = bh$



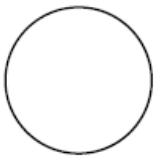
Area of a Trapezoid: $A = \frac{1}{2}(b_1 + b_2)h$

Area of a Parallelogram: $A = bh$



Area of a Circle: $A = \pi r^2$

Circumference of a Circle: $C = 2\pi r = \pi d$



Arc Length of a Circle: $L = \frac{m^o}{360^o}(2\pi r) = \frac{m^o}{360^o}(\pi d)$

Area of a Sector of a Circle: $A = \frac{m^o}{360^o}(\pi r^2)$

Area of a Segment of a Circle = Area of sector – Area of Triangle

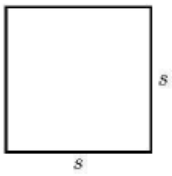
Area of a Regular Polygon:

$A = \frac{1}{2}aP = \frac{1}{2} \times$ apothem $\times$ perimeter

2D GEOMETRY FORMULAS

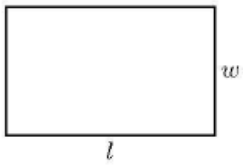
SQUARE

s = side
Area: $A = s^2$
Perimeter: $P = 4s$



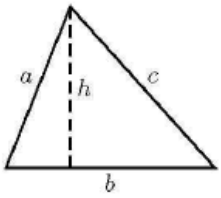
RECTANGLE

l = length, w = width
Area: $A = lw$
Perimeter: $P = 2l + 2w$



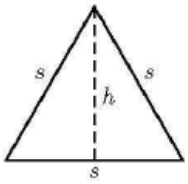
TRIANGLE

b = base, h = height
Area: $A = \frac{1}{2}bh$
Perimeter: $P = a + b + c$



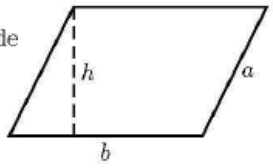
EQUILATERAL TRIANGLE

s = side
Height: $h = \frac{\sqrt{3}}{2}s$
Area: $A = \frac{\sqrt{3}}{4}s^2$



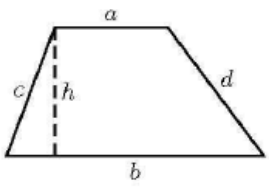
PARALLELOGRAM

b = base, h = height, a = side
Area: $A = bh$
Perimeter: $P = 2a + 2b$



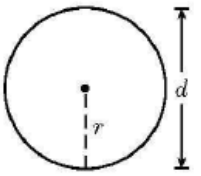
TRAPEZOID

a, b = bases; h = height;
c, d = sides
Area: $A = \frac{1}{2}(a + b)h$
Perimeter:
$P = a + b + c + d$



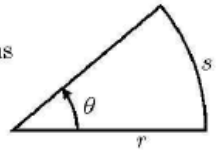
CIRCLE

r = radius, d = diameter
Diameter: $d = 2r$
Area: $A = \pi r^2$
Circumference: $C = 2\pi r = \pi d$



SECTOR OF CIRCLE

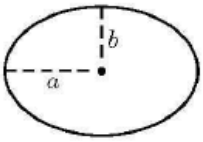
r = radius, θ = angle in radians
Area: $A = \frac{1}{2}\theta r^2$
Arc Length: $s = \theta r$



ELLIPSE

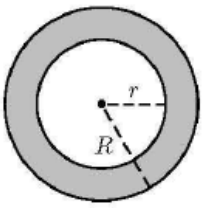
a = semimajor axis
b = semiminor axis
Area: $A = \pi ab$

Circumference:
$C \approx \pi\left(3(a+b) - \sqrt{(a+3b)(b+3a)}\right)$



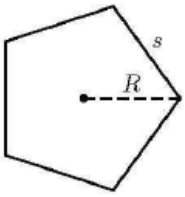
ANNULUS

r = inner radius,
R = outer radius
Average Radius: $\rho = \frac{1}{2}(r + R)$
Width: $w = R - r$
Area: $A = \pi(R^2 - r^2)$
or $A = 2\pi\rho w$

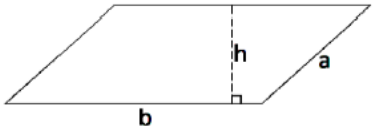
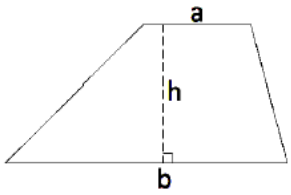
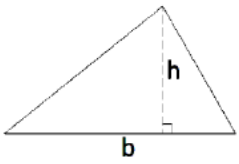
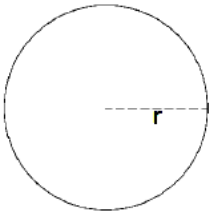
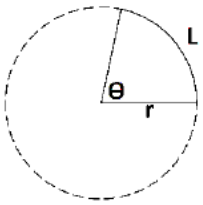
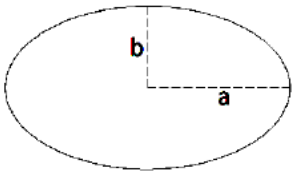


REGULAR POLYGON

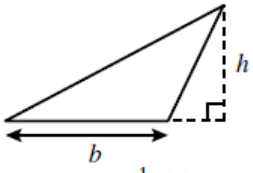
s = side length,
n = number of sides
Circumradius: $R = \frac{1}{2}s\csc(\frac{\pi}{n})$
Area: $A = \frac{1}{4}ns^2\cot(\frac{\pi}{n})$
or $A = \frac{1}{2}nR^2\sin(\frac{2\pi}{n})$



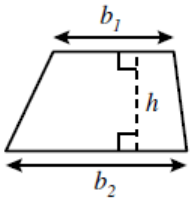
Plane Figure Geometry Formulas:

Name	Figure	Perimeter/Circumference	Area (A)
Rectangle		$P = 2L + 2W$	$A = LW$
Parallelogram		$P = 2a + 2b$	$A = bh$
Trapezoid		Add all four exterior lengths	$A = \frac{1}{2}h(a+b)$
Triangle		Add all three exterior lengths	$A = \frac{1}{2}bh$
Circle		$C = 2\pi r$ **for a circle, perimeter is renamed circumference since it is the measure of a curve	$A = \pi r^2$ $A = \frac{\pi d^2}{4}$ this formula can be used if the diameter (d) is known instead of the radius
Sector		$L = \frac{\theta}{180}\pi r$ **for a sector, perimeter is renamed arc length	$A = \frac{\theta}{360}\pi r^2$
Ellipse		$C = \pi(a+b)j$ $j = 1 + \frac{1}{4}h + \frac{1}{64}h^2 + \frac{1}{256}h^3 + \ldots$ $h = \frac{(a-b)^2}{(a+b)^2}$	$A = \pi ab$

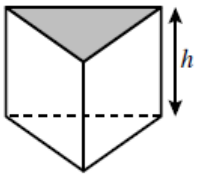
Geometric Formulas



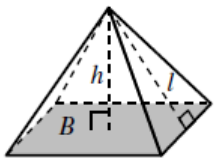
$A = \frac{1}{2}bh$



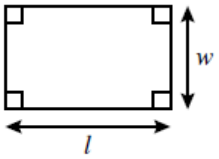
$A = \frac{1}{2}h(b_1 + b_2)$



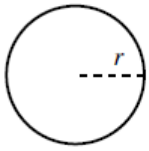
$V = Bh$
$L.A. = hp$
$S.A. = L.A. + 2B$



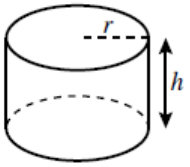
$V = \frac{1}{3}Bh$
$L.A. = \frac{1}{2}lp$
$S.A. = L.A. + B$



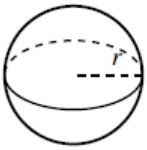
$A = lw$
$p = 2(l + w)$



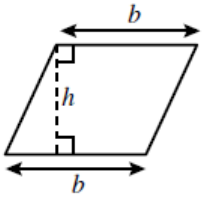
$A = \pi r^2$
$C = 2\pi r$



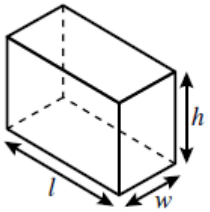
$V = \pi r^2 h$
$L.A. = 2\pi rh$
$S.A. = 2\pi r(h + r)$



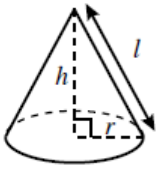
$V = \frac{4}{3}\pi r^3$
$S.A. = 4\pi r^2$



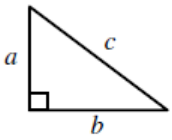
$A = bh$



$V = lwh$
$S.A. = 2lw + 2lh + 2wh$



$V = \frac{1}{3}\pi r^2 h$
$L.A. = \pi rl$
$S.A. = \pi r(l + r)$



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