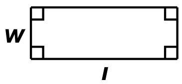
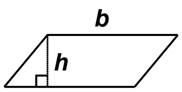
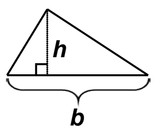
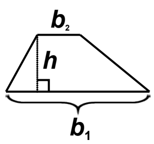
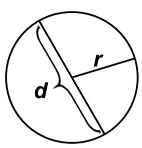
MCAP Maryland Comprehensive Assessment Program

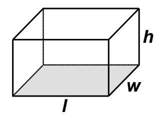
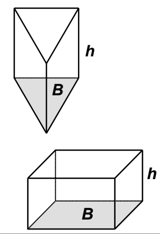
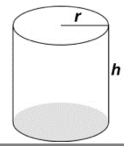
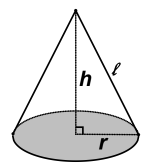
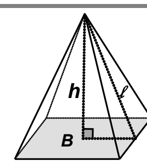
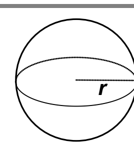
High School Reference Sheet

Formulas

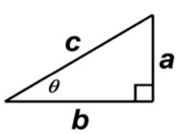
Area (*A*) and Circumference (*C*)

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

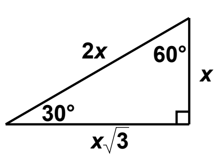
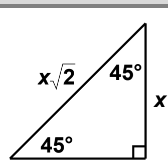
Volume (*V*) and Surface Area (*SA*)

Name	Shape	Formula
Right Rectangular Prism		$V = lwh$ $SA = 2lw + 2hw + 2lh$
General Prism		$V = Bh$ *SA* = Sum of the areas of the faces
Right Circular Cylinder		$V = \pi r^2 h$ $SA = 2\pi r^2 + 2\pi rh$
Right Circular Cone		$V = \frac{1}{3}\pi r^2 h$ $SA = \pi r^2 + \pi r\ell$
Right Pyramid		$V = \frac{1}{3}Bh$ $SA = B + \frac{1}{2}P\ell$
Sphere		$V = \frac{4}{3}\pi r^3$ $SA = 4\pi r^2$

Formulas for Right Triangles

Shape	Formula
	**Pythagorean Theorem** $a^2 + b^2 = c^2$ **Trigonometric Ratios** $\sin\theta = \frac{a}{c}$ $\cos\theta = \frac{b}{c}$ $\tan\theta = \frac{a}{b}$

Special Right Triangles

30°–60°–90°	45°–45°–90°
	

Polygon Angle Formulas

Interior Angle Formulas
Sum of the Interior Angles of a polygon with *n* sides = $180°(n - 2)$
Measure of an interior angle of an *n*-sided regular polygon = $\frac{180°(n-2)}{n}$

Formulas

Equations of a Line
Standard Form: $Ax + By = C$ where A and B are not both zero Slope-Intercept Form: $y = mx + b$ where m = slope and b = y-intercept Point-Slope Form: $y - y_1 = m(x - x_1)$ where m = slope and (x_1, y_1) is a point on the line

Coordinate Geometry Formulas
Let (x_1, y_1) and (x_2, y_2) be two coordinate pairs slope = $\frac{y_2 - y_1}{x_2 - x_1}$ where $x_2 \neq x_1$ midpoint = $\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$ distance = $\sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$

Arithmetic Sequence	Geometric Sequence	Geometric Series
$a_n = a_1 + (n - 1)d$	$a_n = a_1 r^{n-1}$	$S_n = \frac{a_1 - a_1 r^n}{1 - r}$ where $r \neq 1$
Quadratic Formula	**Distance Traveled**	**Arc Length**
$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$	$d = rt$	$S = r\theta$ (where θ is in radians)
Simple Interest	**Compound Interest**	**Continuously Compounded Interest**
$I = prt$	$A = P\left(1 + \frac{r}{n}\right)^{nt}$	$A = Pe^{rt}$

Conversions

Angle Measurements	Weights
1 Radian = $\frac{180}{\pi}$ Degrees 1 Degree = $\frac{\pi}{180}$ Radians	1 pound = 16 ounces 1 pound = 0.454 kilograms 1 ton = 2000 pounds 1 kilogram = 2.2 pounds
Distances	**Volumes**
1 mile = 5280 feet 1 mile = 1760 yards 1 mile = 1.609 kilometers 1 kilometer = 0.62 mile 1 meter = 39.37 inches 1 inch = 2.54 centimeters	1 cup = 8 fluid ounces 1 gallon = 4 quarts 1 pint = 2 cups 1 gallon = 3.785 liters 1 quart = 2 pints 1 liter = 0.264 gallons 1 liter = 1000 cubic centimeters