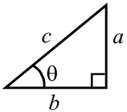


## Geometry Reference Sheet

Triangle Relationships

$a^2 + b^2 = c^2$
$\sin \theta = \frac{a}{c}$
$\cos \theta = \frac{b}{c}$
$\tan \theta = \frac{a}{b}$

Equation of a Line
<b>Standard Form:</b> $Ax + By = C$
<b>Slope-Intercept Form:</b> $y = mx + b$ where $m$ = slope and $b$ = $y$ -intercept
<b>Point-Slope Form:</b> $y - y_1 = m(x - x_1)$

Midpoint Formula
$M = \left( \frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$
$M$ = point halfway between points $(x_1, y_1)$ and $(x_2, y_2)$











Slope of a Line
Let $(x_1, y_1)$ and $(x_2, y_2)$ be two points in the plane.
slope = $\frac{\text{change in } y}{\text{change in } x} = \frac{y_2 - y_1}{x_2 - x_1}$
(where $x_2 \neq x_1$ )

Quadratic Formula
$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$
(where $ax^2 + bx + c = 0$ and $a \neq 0$ )

Distance Formula
$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$
$d$ = distance between points $(x_1, y_1)$ and $(x_2, y_2)$

Circle Formula
$(x - h)^2 + (y - k)^2 = r^2$
where circle has center $(h, k)$ and radius $r$

Standard Form of a Quadratic Equation
$ax^2 + bx + c = 0$
(where $a \neq 0$ )

Shape	Formulas for Area ( $A$ ) and Circumference ( $C$ )	
<b>Triangle</b> 	$A = \frac{1}{2}bh = \frac{1}{2} \times \text{base} \times \text{height}$	
<b>Trapezoid</b> 	$A = \frac{1}{2}(b_1 + b_2)h = \frac{1}{2} \times \text{sum of bases} \times \text{height}$	
<b>Parallelogram</b> 	$A = bh = \text{base} \times \text{height}$	
<b>Circle</b> 	$A = \pi r^2 = \pi \times \text{square of radius}$ $C = 2\pi r = 2 \times \pi \times \text{radius}$	$\pi \approx 3.14$ or $\pi \approx \frac{22}{7}$
Figure	Formulas for Volume ( $V$ ) and Surface Area ( $SA$ )	
<b>Rectangular Solid</b> 	$V = l \times w \times h = \text{length} \times \text{width} \times \text{height}$ $SA = 2 \times l \times w + 2 \times w \times h + 2 \times h \times l$	
<b>Cylinder (total)</b> 	$V = \pi r^2 h = \pi \times \text{square of radius} \times \text{height}$ $SA = 2\pi r h + 2\pi r^2$ $SA = 2 \times \pi \times \text{radius} \times \text{height} + 2 \times \pi \times \text{square of radius}$	$\pi \approx 3.14$ or $\pi \approx \frac{22}{7}$
<b>Sphere</b> 	$V = \frac{4}{3}\pi r^3 = \frac{4}{3} \times \pi \times \text{cube of radius}$ $SA = 4\pi r^2 = 4 \times \pi \times \text{square of radius}$	
<b>Cone</b> 	$V = \frac{1}{3}\pi r^2 h = \frac{1}{3} \times \pi \times \text{square of radius} \times \text{height}$	
<b>Pyramid</b> 	$V = \frac{1}{3}Bh = \frac{1}{3} \times \text{area of base} \times \text{height}$	
<b>Prism</b> 	$V = Bh = \text{area of base} \times \text{height}$	

Copyright © 2006 by State of Indiana Department of Education