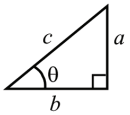
Geometry Reference Sheet

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

Standard Form: $Ax + By = C$
Slope-Intercept Form: $y = mx + b$
where m = slope and b = y-intercept
Point-Slope Form:
$y - y_1 = m(x - x_1)$

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