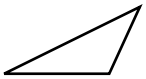
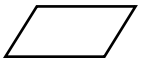
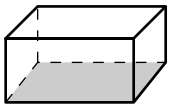
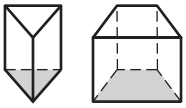
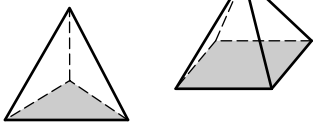
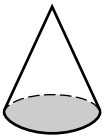
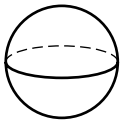
Wisconsin Mathematics Formula Reference Sheet

Shape	Formulas for Area (A) and Circumference (C)
Triangle 	$A = \frac{1}{2}bh = \frac{1}{2} \times$ base $\times$ height
Rectangle 	$A = lw =$ length $\times$ width
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
Figure	**Formulas for Volume (V) and Surface Area (SA)**
Rectangular Prism 	$V = lwh =$ length $\times$ width $\times$ height $SA = 2lw + 2hw + 2lh$ $=$ 2(length $\times$ width) + 2(height $\times$ width) + 2(length $\times$ height)
General Prisms 	$V = Bh =$ area of base $\times$ height $SA =$ sum of the areas of the faces
Right Circular Cylinder 	$V = Bh =$ area of base $\times$ height $SA = 2B + Ch =$ (2 $\times$ area of base) + (circumference $\times$ height)
Right Pyramid 	$V = \frac{1}{3}Bh = \frac{1}{3} \times$ area of base $\times$ height $SA = B + \frac{1}{2}P\ell$ $=$ area of base + ($\frac{1}{2} \times$ perimeter of base $\times$ slant height)
Right Circular Cone 	$V = \frac{1}{3}Bh = \frac{1}{3} \times$ area of base $\times$ height $SA = B + \frac{1}{2}C\ell =$ area of base + ($\frac{1}{2} \times$ circumference $\times$ slant height)
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

Equations of a Line

Slope-Intercept Form: $y = mx + b$

where m = slope and b = y-intercept

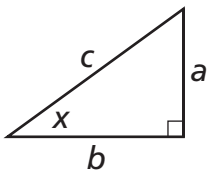
Point-Slope Form: $y - y_1 = m(x - x_1)$

where m = slope, (x_1, y_1) = point on line

Combinations and Permutations

$$nCr = \frac{n!}{r!(n-r)!} \qquad nPr = \frac{n!}{(n-r)!}$$

Formulas for Right Triangles



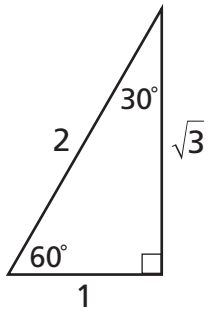
$$\sin x = \frac{a}{c} = \left(\frac{\text{opp}}{\text{hyp}}\right)$$

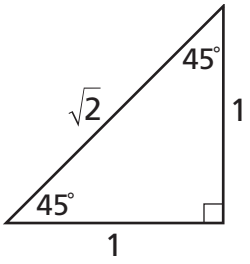
$$\cos x = \frac{b}{c} = \left(\frac{\text{adj}}{\text{hyp}}\right)$$

$$\tan x = \frac{a}{b} = \left(\frac{\text{opp}}{\text{adj}}\right)$$

Pythagorean Theorem: $a^2 + b^2 = c^2$

Special Right Triangles





Coordinate Geometry Formulas

Let (x_1, y_1) and (x_2, y_2) be two points in the plane.

$$\text{slope} = \frac{y_2 - y_1}{x_2 - x_1} \text{ where } x_2 \neq x_1$$

$$\text{midpoint} = \left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2}\right)$$

$$\text{distance} = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$$

Polygon Angle Formulas

Sum of degree measures of the interior angles of a polygon:

$$180(n - 2)$$

Degree measure of an interior angle of a regular polygon:

$$\frac{180(n-2)}{n}$$

where n is the number of sides of the polygon

Interest Formulas

Simple Interest: $A = P(1 + rt)$

Compound Interest: $A = P\left(1 + \frac{r}{n}\right)^{nt}$

A = amount (including interest)
P = principal
r = interest rate (expressed as a decimal)
n = number of compoundings per year
t = number of years

Quadratic Equations

Let $ax^2 + bx + c = 0$, where $a \neq 0$.

Then $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$

x-coordinate of vertex = $-\frac{b}{2a}$

Distance Traveled

$$d = rt$$

distance = rate × time