

MIDDLE GRADES MATH FORMULAS AND NOTATIONS

Formula	Description
$C = \pi d = 2\pi r$	Circumference of a circle
$A = \pi r^2$	Area of a circle
$A = \frac{1}{2}bh$	Area of a triangle
$A = \left(\frac{b_1 + b_2}{2}\right)h$	Area of a trapezoid
$A = Bh$	Volume of a prism
$V = \frac{1}{3}Bh$	Volume of a right cone and a pyramid
$V = \pi r^2 h$	Volume of a cylinder
$V = \frac{4}{3}\pi r^3$	Volume of a sphere
$A = 4\pi r^2$	Surface area of a sphere
$A = \pi r \sqrt{r^2 + h^2}$	Lateral surface area of a right circular cone
$(x-h)^2 + (y-k)^2 + (z-j)^2 = r^2$	Equation of a sphere
$(x-h)^2 + (y-k)^2 = r^2$	Equation of a circle
$y = a(x-h)^2 + k$	Equation of a parabola (vertex form)
$C = \frac{x_2 - x_1}{x_1}$	Percent change
$S_n = \frac{n}{2}[2a + (n - 1)d] = n\left(\frac{a + a_n}{2}\right)$	Sum of an arithmetic series
$S_n = \frac{a(1 - r^n)}{1 - r}$	Sum of a geometric series
$a^2 + b^2 = c^2$	Pythagorean formula
$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$	Distance formula

FORMULAS AND NOTATIONS (continued)

$m = \frac{\Delta y}{\Delta x} = \frac{y_2 - y_1}{x_2 - x_1}$	Slope formula
$\left(\frac{x_1 + x_2}{2}, \frac{y_1 + y_2}{2} \right)$	Midpoint formula
$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$	Law of sines
$c^2 = a^2 + b^2 - 2ab \cos C$	Law of cosines
$x < Q_1 - 1.5(IQR)$ $x > Q_3 + 1.5(IQR)$	Definition of an outlier
$MAD = \frac{\sum_{i=1}^n x_i - \bar{x} }{n}$	Mean absolute deviation (MAD) formula
$s^2 = \frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n - 1}$	Sample variance
$s = r\theta$	Arc length
$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$	Quadratic formula
A' is the complement of set A	Set theory
${}_nP_r = P(n,r) = \frac{n!}{(n-r)!}$	Permutation
${}_nC_r = C(n,r) = \frac{n!}{(n-r)!r!}$	Combination