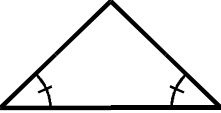

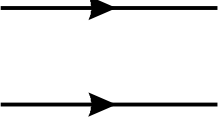


Definitions and Formulas for Middle Level/Intermediate Mathematics

Notation	Description
$i = \sqrt{-1}$	imaginary unit
\bar{z}	complex conjugate of z
A^{-1}	inverse of matrix A
\mathbf{v}	vector v
\sim	is similar to
\cong	is congruent to
	congruent angles
	congruent sides
	parallel lines

Formula	Description
$V = \frac{1}{3}Bh$	volume of a right cone and a pyramid
$A = 4\pi r^2$	surface area of a sphere
$V = \frac{4}{3}\pi r^3$	volume of a sphere
$S_n = \frac{n}{2}[2a + (n - 1)d] = n\left(\frac{a + a_n}{2}\right)$	sum of an arithmetic series
$S_n = \frac{a(1 - r^n)}{1 - r}$	sum of a geometric series
$\sum_{n=0}^{\infty} ar^n = \frac{a}{1 - r}, r < 1$	sum of an infinite geometric series
$d = \sqrt{(x_2 - x_1)^2 + (y_2 - y_1)^2}$	distance formula
$(x - h)^2 + (y - k)^2 = r^2$	circle
$s^2 = \frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n - 1}$	variance
$s = r\theta$	arc length
$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$	quadratic formula
$A = P\left(1 + \frac{r}{n}\right)^{nt}$	compound interest
${}^nC_r = \frac{n!}{r!(n - r)!}$	combinations
${}^nP_r = \frac{n!}{(n - r)!}$	permutations
$\sin \theta = \frac{\text{opp}}{\text{hyp}}$	sine of θ in a right triangle
$\cos \theta = \frac{\text{adj}}{\text{hyp}}$	cosine of θ in a right triangle
$\tan \theta = \frac{\text{opp}}{\text{adj}}$	tangent of θ in a right triangle

END OF DEFINITIONS AND FORMULAS