Symbols & Tables

PYTHAGOREAN THEOREM

$L^2 + L^2 = H^2$

LAW OF SINES

$$\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$$

LAW OF COSINES

$a^2 = b^2 + c^2 - 2bc \cos A$

$b^2 = a^2 + c^2 - 2ac \cos B$

$c^2 = a^2 + b^2 - 2ab \cos C$

INDENTITIES

$\sin^2 A + \cos^2 A = 1$

$\tan = \frac{\sin}{\cos}$ $\cot = \frac{\cos}{\sin}$

TRIGONOMETRIC RATIOS

$\sin = \frac{opp}{hyp}$ $\cos = \frac{adj}{hyp}$ $\tan = \frac{opp}{adj}$

$\csc = \frac{hyp}{opp}$ $\sec = \frac{hyp}{adj}$ $\cot = \frac{adj}{opp}$

DEGREES TO RADIANS

multiply by $\frac{\pi r}{180^o}$

RADIANS TO DEGREES

multiply by $\frac{180^o}{\pi r}$

NATURAL LOG FUNCTION

$\ln 1 = 0$

$\ln e = 1$

$\ln e^x = X$

$\ln xy = \ln x + \ln y$

$\ln x/y = \ln x - \ln y$

$\ln x^a = a \ln x$

$e^{\ln x} = x$ when $x \geq 0$

DIFFERENCE INDENTITIES

$\cos (A - B) = \cos A \cos B + \sin A \sin B$

$\sin (A - B) = \sin A \cos B - \cos A \sin B$

$\tan (A - B) = \frac{\tan A - \tan B}{1 + \tan A \tan B}$

SUM INDENTITIES

$\cos (A + B) = \cos A \cos B - \sin A \sin B$

$\sin (A + B) = \sin A \cos B + \cos A \sin B$

$\tan (A + B) = \frac{\tan A + \tan B}{1 - \tan A \tan B}$

MISCELLANEOUS IDENTITIES

Sin 2A Indentity

$\sin 2A = 2 \sin A \cos A$

Cos 2A Indentity

$\cos 2A = \cos^2 A - \sin^2 A$

Tan 2A Indentity

$\tan 2A = \frac{2 \tan A}{1 - \tan^2 A}$

Sin $\frac{B}{2}$ Identity

$\sin \frac{B}{2} = \pm\sqrt{\frac{1 - \cos B}{2}}$

Cos $\frac{B}{2}$ Identity

$\cos \frac{B}{2} = \pm\sqrt{\frac{1 + \cos B}{2}}$

Tan $\frac{B}{2}$ Identity #1

$\tan \frac{B}{2} = \pm\sqrt{\frac{1 - \cos B}{1 + \cos B}}$

Tan $\frac{B}{2}$ Identity #2

$\tan \frac{B}{2} = \frac{1 - \cos B}{\sin B}$

Tan $\frac{B}{2}$ Identity #3

$\tan \frac{B}{2} = \frac{\sin B}{1 + \cos B}$

GRAPHING SINE AND COSINE FUNCTIONS

$Y = A \sin P(\theta - S) + T$

T = translation

A = amplitude

P = used to find the period $(2\pi/P)$

S = shift

FINDING GIVEN TERM OF AN ARITHMETIC SEQUENCE

$S_n = a_1 + (n - 1)d$

FINDING SUM OF THE TERMS OF AN ARITHMETIC SERIES

$$\frac{n(a_1 + a_n)}{2} \quad \text{or} \quad \frac{n}{2}\{2a_1 + (n - 1)d\}$$

FINDING GIVEN TERM OF A GEOMETRIC SEQUENCE

$\{S_n\} = \{a_1 \cdot r^{n-1}\}$

FINDING THE SUM OF A GEOMETRIC SERIES

$$\frac{a_1(1 - r^n)}{1 - r}$$

RECTANGULAR EQUATIONS

line	$AX + BY = C$
circle	$AX^2 + AY^2 = C$
ellipse	$AX^2 + BY^2 = C$
parabola	$Y = X^2$
hyperbola	$XY = C$ and $X^2 - Y^2 = C$

BINOMIAL THEOREM

$$(A - B)^N = A^N B^0 + \frac{N}{1} A^{N-1}B^1 + \frac{N(N-1)}{1(2)} A^{N-2}B^2 + \frac{N(N-1)(N-2)}{1(2)(3)} A^{N-3}B^3 \ldots A^0 B^N$$

QUADRATIC FORMULA

$$X = \frac{-B \pm \sqrt{B^2 - 4AC}}{2A}$$