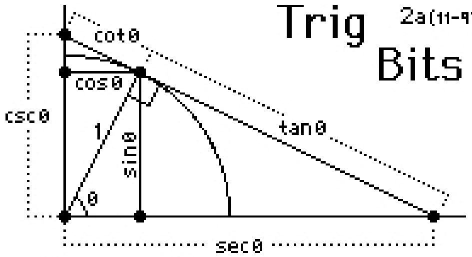
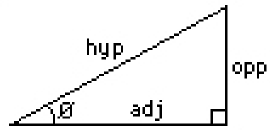


Trig Bits

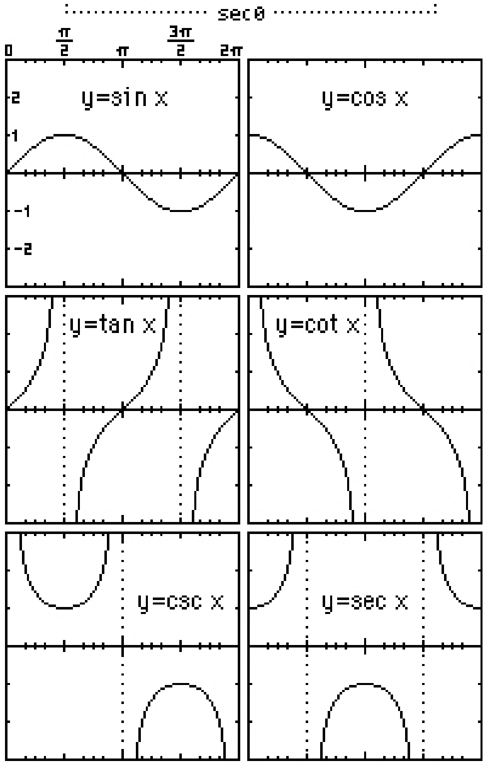
2a (11-97)



$\text{Sin } Ø = \frac{\text{opp}}{\text{hyp}}$ $\text{Tan } Ø = \frac{\text{opp}}{\text{adj}}$

$\text{Cos } Ø = \frac{\text{adj}}{\text{hyp}}$

opp = hyp•sin Ø
adj = hyp•cos Ø



On the Unit Circle

Sin ø = y

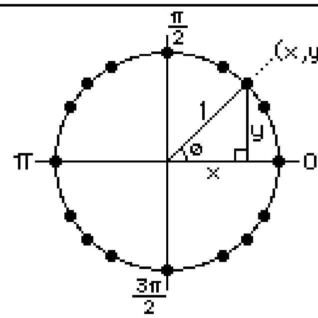
Cos ø = x

$\text{Tan } ø = \frac{y}{x} = \frac{\text{Sin } ø}{\text{Cos } ø}$

$\text{Cot } ø = \frac{x}{y} = \frac{\text{Cos } ø}{\text{Sin } ø}$

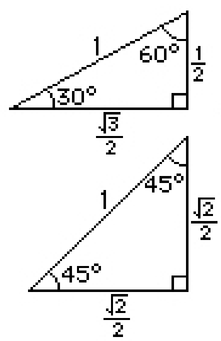
$\text{Sec } ø = \frac{1}{x} = \frac{1}{\text{Cos } ø}$

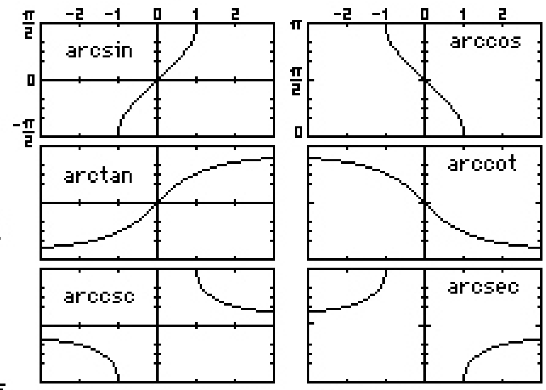
$\text{Csc } ø = \frac{1}{y} = \frac{1}{\text{Sin } ø}$



Positive
(A,S,T,C)

SinØ CscØ	All
TanØ CotØ	CosØ SecØ





Addition Identities

Sin (a ± b) = Sin a Cos b ± Cos a Sin b

Cos(a ± b) = Cos a Cos b ∓ Sin a Sin b

$\text{Tan}(a \pm b) = \frac{\text{Tan } a \pm \text{Tan } b}{1 \mp \text{Tan } a \text{ Tan } b}$

Negative Angles

Sin (-a) = -Sin (a)

Cos(-a) = Cos(a)

Tan(-a) = -Tan(a)

m°	mʳ	SinØ	CosØ	TanØ	CotØ	CscØ	SecØ	Arc Ansr
0	0	0	1	0	Undef	Undef	1	0
30	π/6	1/2	√3/2	√3/3	√3	2	2√3/3	π/6
45	π/4	√2/2	√2/2	1	1	√2	√2	π/4
60	π/3	√3/2	1/2	√3	√3/3	2√3/3	2	π/3
90	π/2	1	0	Undef	0	1	Undef	π/2
120	2π/3	√3/2	- 1/2	-√3	-√3/3	2√3/3	- 2	2π/3
135	3π/4	√2/2	-√2/2	- 1	- 1	√2	- √2	3π/4
150	5π/6	1/2	-√3/2	-√3/3	-√3	2	- 2√3/3	5π/6
180	π	0	- 1	0	Undef	Undef	- 1	π
210	7π/6	- 1/2	-√3/2	√3/3	√3	- 2	- 2√3/3	
225	5π/4	-√2/2	-√2/2	1	1	- √2	- √2	
240	4π/3	-√3/2	- 1/2	√3	√3/3	- 2√3/3	- 2	
270	3π/2	- 1	0	Undef	0	- 1	Undef	-π/2
300	5π/3	-√3/2	1/2	-√3	-√3/3	- 2√3/3	2	-π/3
315	7π/4	-√2/2	√2/2	- 1	- 1	- √2	√2	-π/4
330	11π/6	- 1/2	√3/2	-√3/3	-√3	- 2	2√3/3	-π/6
360	2π	0	1	0	Undef	Undef	1	0

Half Angle Formulas

$$\text{Sin}\frac{Ø}{2} = \pm\sqrt{\frac{1 - \text{Cos } Ø}{2}}$$

$$\text{Cos}\frac{Ø}{2} = \pm\sqrt{\frac{1 + \text{Cos } Ø}{2}}$$

$$\text{Tan}\frac{Ø}{2} = \frac{1 - \text{Cos } Ø}{\text{Sin } Ø} = \frac{\text{Sin}Ø}{1 + \text{Cos } Ø}$$

Double Angle Formulas

Sin (2Ø) = 2 Sin Ø Cos Ø

$\text{Cos}(2Ø) = \text{Cos}^2Ø - \text{Sin}^2Ø$

$\text{Cos}(2Ø) = 2\text{ Cos}^2Ø - 1$

$\text{Cos}(2Ø) = 1 - 2\text{ Sin}^2Ø$

Triangle Identities

$\text{Sin}^2Ø + \text{Cos}^2Ø = 1$

$1 + \text{Tan}^2Ø = \text{Sec}^2Ø$

$1 + \text{Cot}^2Ø = \text{Csc}^2Ø$

Cofunction Identities

$\text{Sin}\left(\frac{\pi}{2} - Ø\right) = \text{Cos } Ø$

$\text{Cos}\left(\frac{\pi}{2} - Ø\right) = \text{Sin } Ø$

$\text{Tan}\left(\frac{\pi}{2} - Ø\right) = \text{Cot } Ø$

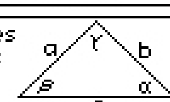
Conversions: $m° \cdot \frac{\pi}{180°} = m^r$ $m^r \cdot \frac{180°}{\pi} = m°$

Aproximate π's: 22/7 or 355/113

y = A Sin [B(x - C)] + D
y = A Cos[B(x - C)] + D

A = Amplitude
B = Frequency in 2π
(2π/B = Period)
C = x shift
D = y shift

Laws of Sines and Cosines



$$\frac{\sin\alpha}{a} = \frac{\sin\beta}{b} = \frac{\sin\gamma}{c}$$

$$a^2 = b^2 + c^2 - 2 \cdot b \cdot c \cdot \text{Cos } \alpha$$