TRIGONOMETRIC FUNCTIONS

Note: All these formats are interchangeable: $sin^{-1} t$ = *invsin t* = *arcsin t*

The sin (t) and sin^{-1} (t) functions | **The cos (t) and cos^{-1} (t) functions** | **The tan (t) and tan^{-1} (t) functions**

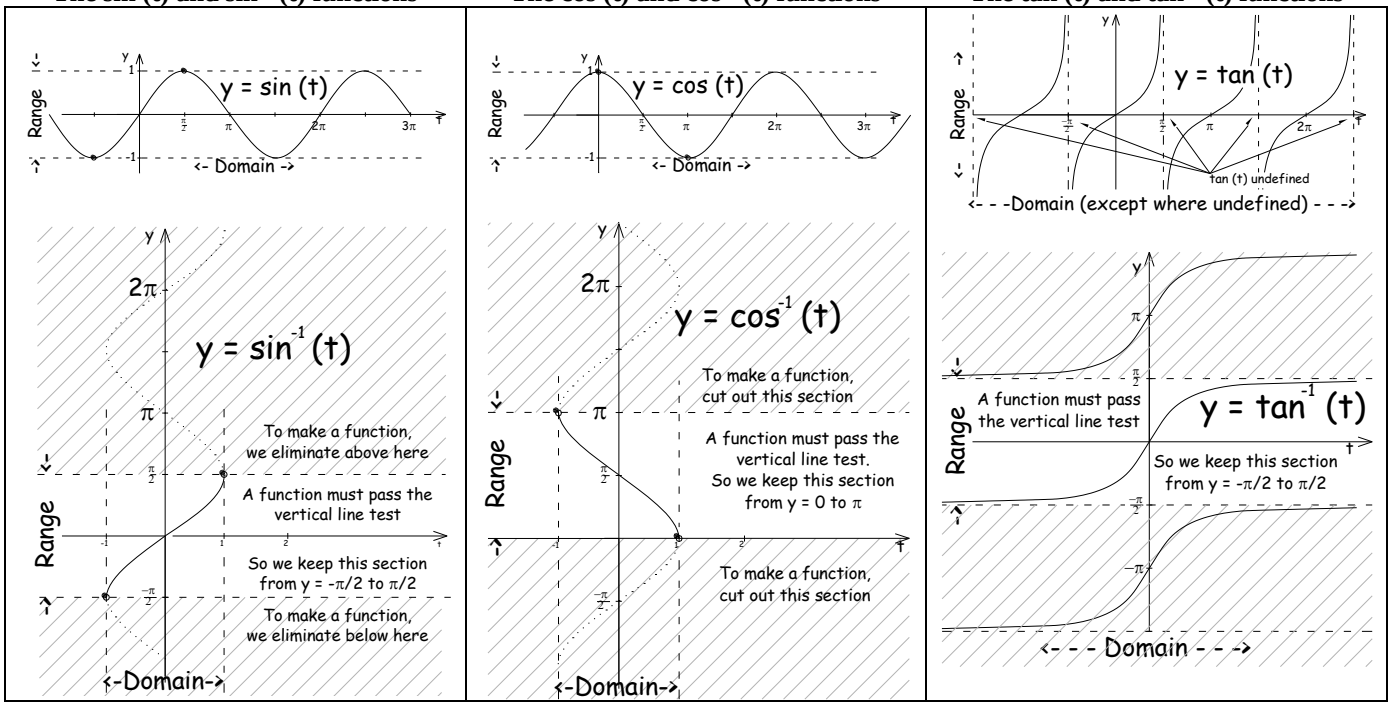


Table of Domain and Range for Basic Trig functions.	Function	y = sin t	y = cos t	y = tan t		sin θ	cos θ	tan θ
	Domain	(-∞, ∞)	(-∞, ∞)	$t \neq \pm\pi/2 \pm 2n\pi$		[-1, 1]	[-1,1]	(-∞, ∞)
	Range	[-1, 1]	[-1,1]	(-∞, ∞)		[-π/2, π/2]	[0, π]	(-π/2, π/2)

For Geometric uses of trigonometric functions

y is a ratio of sides y is non-dimensional i.e. y is always unitless	y = sin t y = cos t y = tan t	t is an "angle" t is in either deg or radians

y is an "angle" y is either deg or radians	$y = sin^{-1} t$ $y = cos^{-1} t$ $y = tan^{-1} t$	y is non-dimensional i.e. y is unitless

GRAPHING BASICS

Notation for y = A sin[b(t − h)] + k

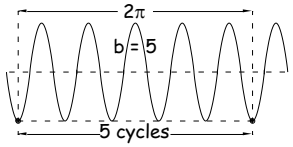
One Period (p) = One Wavelength (λ) = Time of One Cycle (T)

Frequency (f) = cycles/sec = Hertz (Hz). f = 1/T = b/(2π)

A = amplitude. Max/min displacement from equilibrium

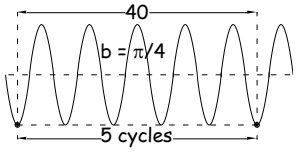
h = horizontal shift ('−' shift right), k = vertical shift ('+' shift up)

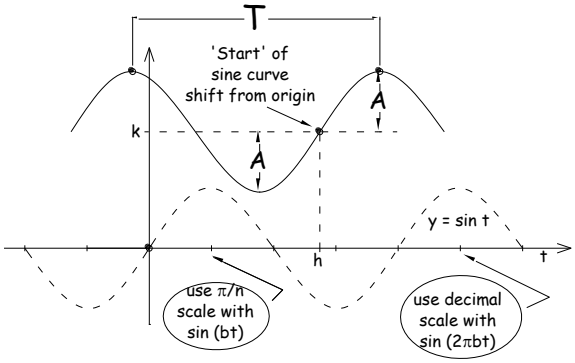
b = the number of cycles in 2π.
Sometimes you can easily count 'b'.
In this example, b = 5.



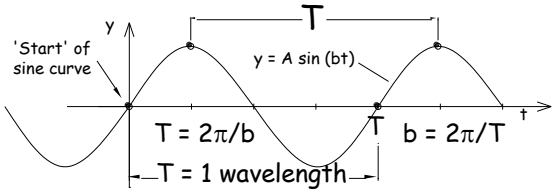
Sometimes you must compute b.
To compute b, measure one or more waves to compute T. Then b = 2π/T.

Here T = 40/5 = 8. b = 2π/8 = π/4





$y = A\sin[b(t - h)] + k$



For y = f(x) sin (bx), f(x) acts as the amplitude for sin (bx)

Here, f(x) is a linear function of the form mx. To find m, use any local max data point.