

Radians

IMPORTANT: Put your calculator in radians

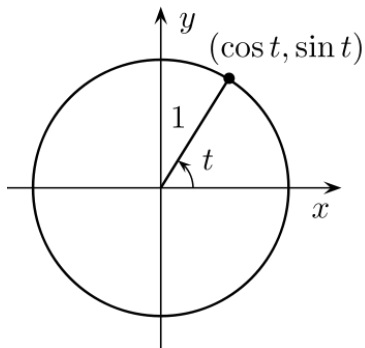
[https://en.wikipedia.org/wiki/Radian#/media/File:
Circle_radians.gif](https://en.wikipedia.org/wiki/Radian#/media/File:Circle_radians.gif)

$$\text{Arclength} = r\theta$$

Unit circle

$$\sin t = y$$

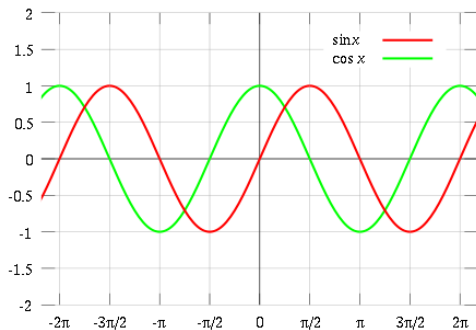
$$\cos t = x$$



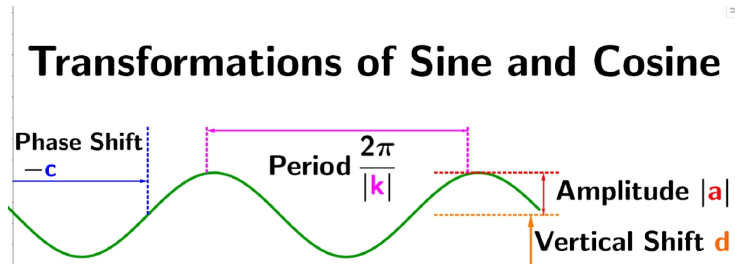
Functions

$$f(t) = \sin(t), \quad g(t) = \cos(t)$$

$$\cos(t) = \sin(t + \pi/2), \quad \sin(t) = \cos(t - \pi/2)$$



Transformations of Sine and Cosine



$$f(x) = a * \sin(k(x + c)) + d$$

pg. 46: Problem 19, 23.

Problem 19

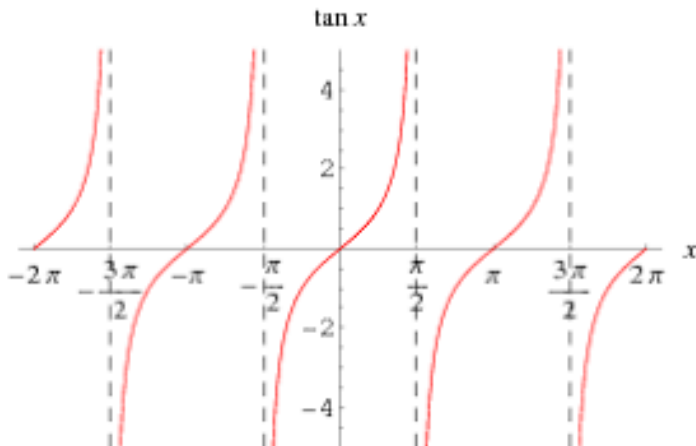
$$f(x) = 2 \cos(5x)$$

Problem 23

$$f(x) = 3 + 3 \sin\left(\frac{\pi}{4}x\right)$$

Tangent

$$\tan(t) = \frac{\sin(t)}{\cos(t)}$$



Inverse Sin Functions

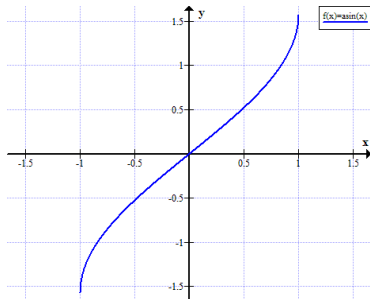
for $-1 \leq y \leq 1$

$$\arcsin(y) = x$$

means

$$\sin(x) = y$$

with $-\frac{\pi}{2} \leq x \leq \frac{\pi}{2}$
Also denoted \sin^{-1}



Inverse Tan Functions

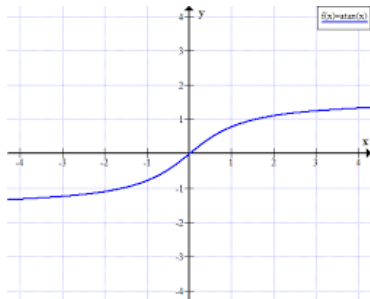
for any y

$$\arctan(y) = x$$

means

$$\tan(x) = y$$

with $-\frac{\pi}{2} < x < \frac{\pi}{2}$
Also denoted \tan^{-1}



Problem 30

$$2 = 5 \sin(3x)$$

$$\frac{2}{5} = \sin(3x)$$

$$\sin^{-1}\left(\frac{2}{5}\right) = 3x$$

$$\frac{1}{3} \sin^{-1}\left(\frac{2}{5}\right) = x$$

As a group pg. 46: Problem 33

I will do pg. 47: Problem 47

As a group pg. 47: Problem 49

Together pg. 47: Problem 50-53

Problem 85,92,94

True or False? Give an explanation:

85. If t is in seconds, $g(t) = \cos(200\pi t)$ executes 100 cycles (periods) in one second.

92. The function $g(\theta) = e^{\sin \theta}$ is periodic. 94. The $g(x)$ is a periodic function, then $f(g(x))$ is a periodic function for every $f(x)$.

As a group pg. 47-48: Problem 62,65,68