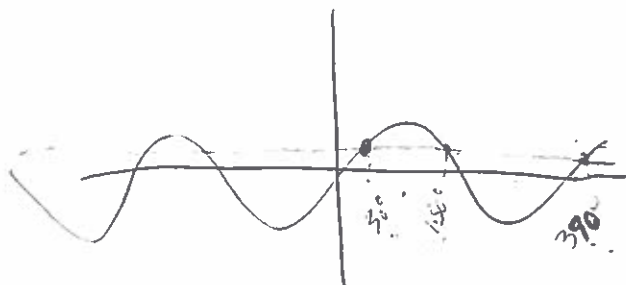


# Solving Trig Equations

Ex  $\sin x = .5$

$$x = \sin^{-1}(.5) = \frac{\pi}{6} \approx .52 \approx 30^\circ$$

radians
degrees

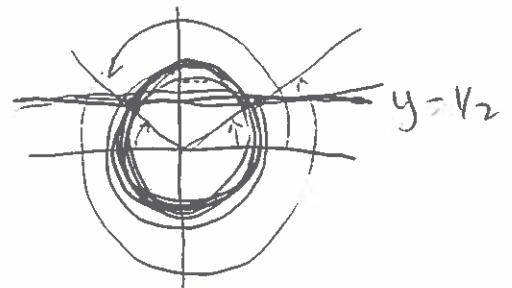


$$y_1 = \sin x$$

$$y_2 = .5$$

$$x = 30^\circ + 360^\circ n$$

$$x = 150^\circ + 360^\circ n$$

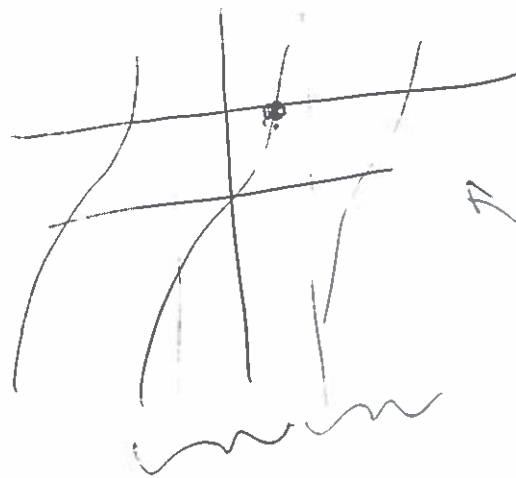


Ex

$$\tan \theta = 2$$

$$\theta = \tan^{-1}(2)$$

$$= 1.07 \text{ or } 63.43^\circ$$



Period =  $\pi$

$$= 1.07 + n\pi$$

or

$$63.43^\circ + 180^\circ n$$



EX

$$\sin(2x) = \tan x$$

$$x = 0^\circ, 45^\circ, -45^\circ$$

$180^\circ$   
period

$$x = 0^\circ + 180^\circ n$$

$$x = 45^\circ + 180^\circ n$$

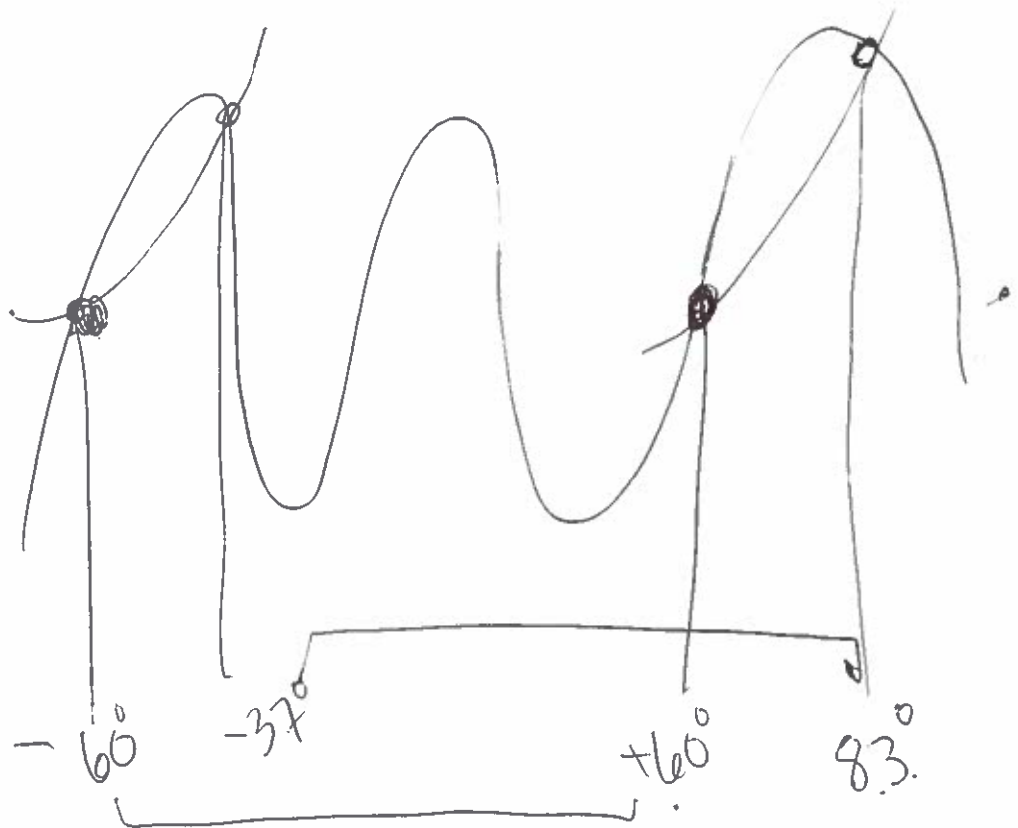
$$x = -45^\circ + 180^\circ n$$

EX

$$\sin(6x) = 1 + \cos(3x)$$

$$\begin{array}{l} -60^\circ \\ -36.7^\circ \end{array} \xrightarrow{+120^\circ} \begin{array}{l} 43.2^\circ \\ 60^\circ \end{array}$$

$$\begin{array}{l} 60^\circ + 120^\circ n \\ 43^\circ + 120^\circ n \end{array}$$



X	Y
1	2
3	4
5	6

X	Y <sup>-1</sup>
2	1
4	3
6	5

$$\sin(A) = B$$

$$\sin^{-1}(B) = A$$

X	sin(X)
A	B
C	D
E	F

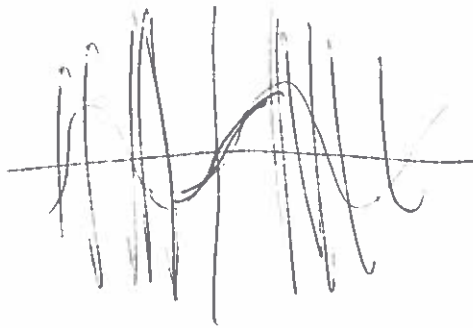
↑  
Degrees  
or  
Radians

↑  
Output  
between  
-1 & 1

x	sin <sup>-1</sup> (x)
B	A
D	C
F	E

↑  
Input  
between  
-1 & 1

↑  
Output  
Degrees  
or  
Radians



Solve for x

$$3 \tan(2x-1) + 7 = 15$$

$$\begin{array}{r} -7 \\ -7 \end{array}$$

---

$$3 \tan(2x-1)$$

$$\underline{\quad}$$

$$\begin{array}{r} 8 \\ 3 \end{array}$$

$$\tan(2x-1) = \frac{8}{3}$$

$$2x-1 = \tan^{-1}\left(\frac{8}{3}\right)$$

$$\frac{2x}{2} = \frac{1 + \tan^{-1}\left(\frac{8}{3}\right)}{2}$$

$$x = \frac{1 + \tan^{-1}\left(\frac{8}{3}\right)}{2}$$

$$x = 35.72 + 90^\circ$$

$$35.72^\circ$$

$$\begin{array}{r} 125.72 \\ - 35.72 \\ \hline 90 \end{array}$$