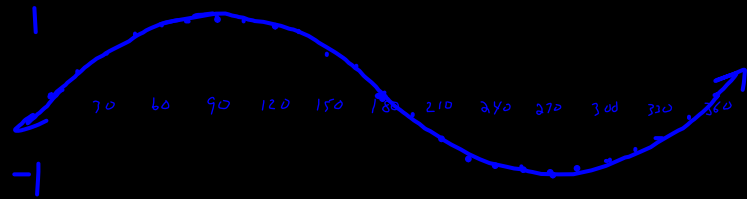
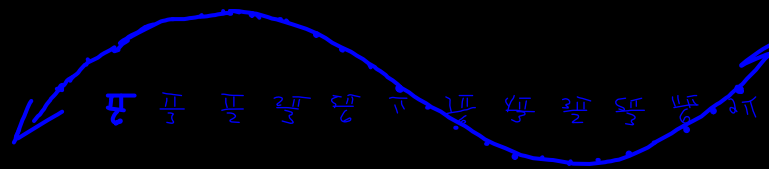


# Graph of Sine and Cosine in Degrees and Radians

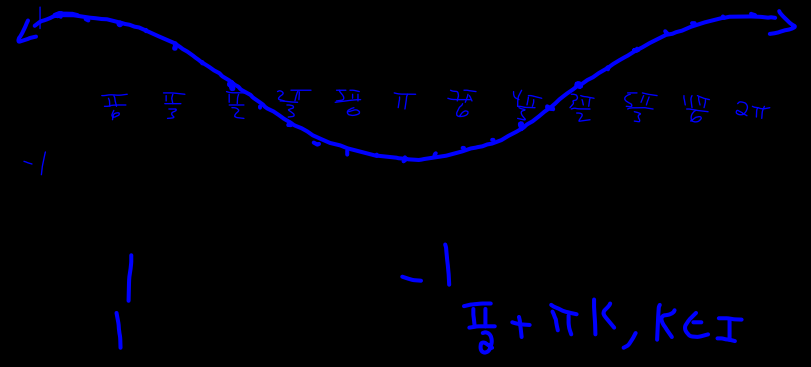
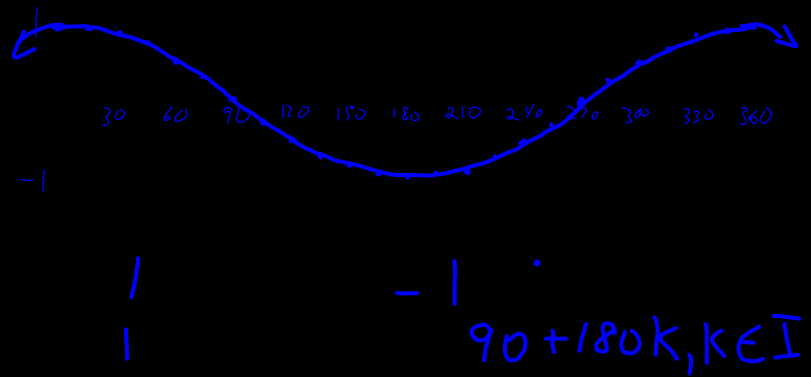


0'  $180k, k \in \mathbb{I}$



0'  $\pi k, k \in \mathbb{I}$

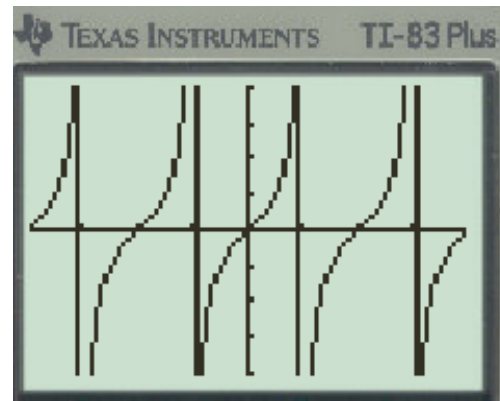
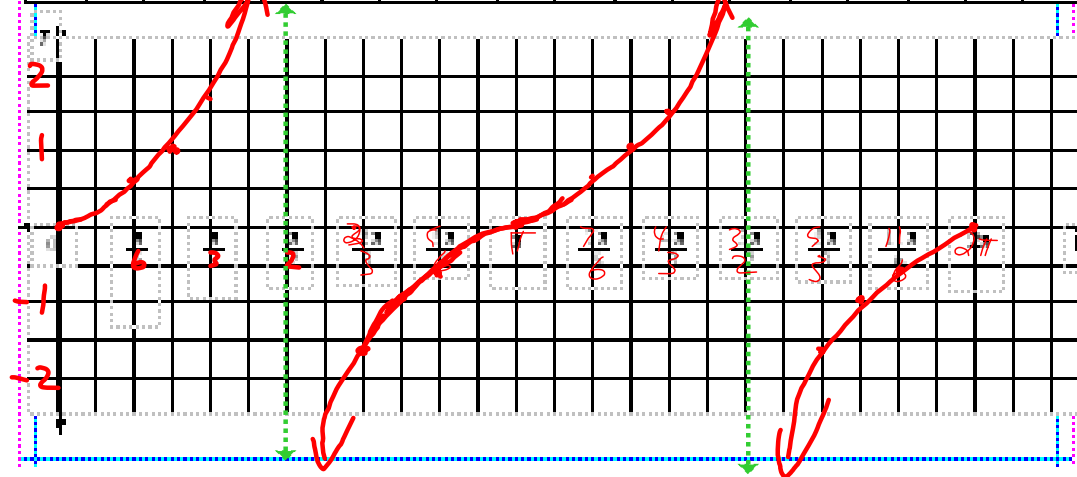
Graph of Sine and Cosine in Degrees and Radians (Continued)



## Graph of $y = \tan \theta$

3. Graphing  $y = \tan \theta$ , using radian measure

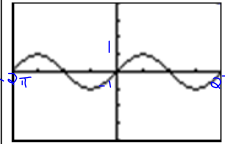
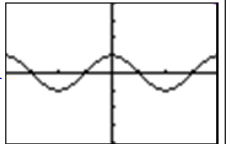
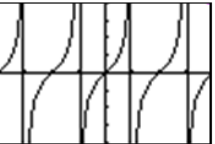
$\theta$	0	$\frac{\pi}{4}$	$\frac{\pi}{2}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$	$\frac{2\pi}{3}$	$\frac{3\pi}{4}$	$\frac{3\pi}{4}$	$\pi$	$\frac{7\pi}{4}$	$\frac{5\pi}{4}$	$\frac{4\pi}{3}$	$\frac{3\pi}{2}$	$\frac{5\pi}{3}$	$\frac{7\pi}{4}$	$\frac{11\pi}{4}$	$2\pi$
$\tan \theta$	0	.57	1.7	-	-1.7	-1	-.57	0	.57	1.7	-	-1.7	-1	-.57	0		



Even function  $\Rightarrow f(-x) = f(x)$   
 odd function  $\Rightarrow f(-x) = -f(x)$

### KEY CONCEPTS

#### Characteristics of the Sine, Cosine and Tangent Functions

	$y = \sin\theta$	$y = \cos\theta$	$y = \tan\theta$
Domain	any real number $\{x \in \mathbb{R}\}$	$\{x \in \mathbb{R}\}$	$\{x \neq \frac{\pi}{2} + k\pi, x \in \mathbb{R}, k \in \mathbb{I}\}$
Range	$\{-1 \leq y \leq 1, y \in \mathbb{R}\}$	$\{-1 \leq y \leq 1, y \in \mathbb{R}\}$	$\{y \in \mathbb{R}\}$
Period	$2\pi$	$2\pi$	$\pi$
Symmetry (odd or even function)	$\sin(-x) = -\sin x$ so odd function	$\cos(-x) = \cos(x)$ so even function	odd $\tan(-x) = -\tan x$
x-intercept	$\pi k, k \in \mathbb{I}$	$\frac{\pi}{2} + \pi k, k \in \mathbb{I}$	$\pi k, k \in \mathbb{I}$
y-intercept	0	1	0
Maximum Value	1	1	No max
Minimum Value	-1	-1	No min
Asymptotes	NONE	NONE	$x = \frac{\pi}{2} + k\pi, k \in \mathbb{I}$
Sketch of Graph			

2,4,6,8 (graph one from each question)  
 9-14, 18