

Graphs of Trigonometric Functions

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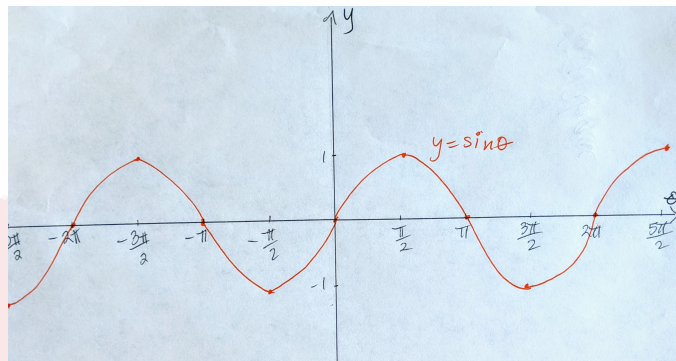
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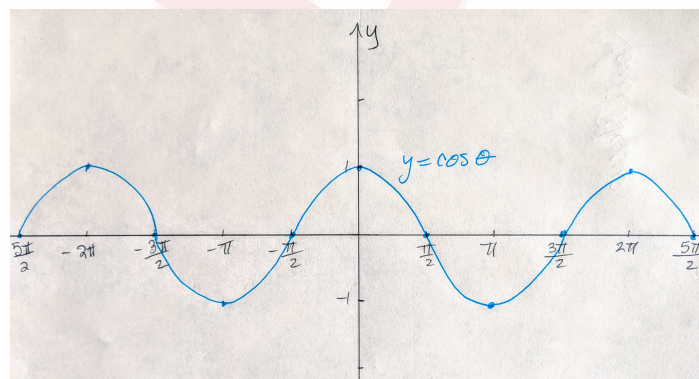
Graph of $\sin \theta$

θ	0	$\pi/2$	π	$3\pi/2$	2π
$\sin \theta$	0	1	0	-1	0



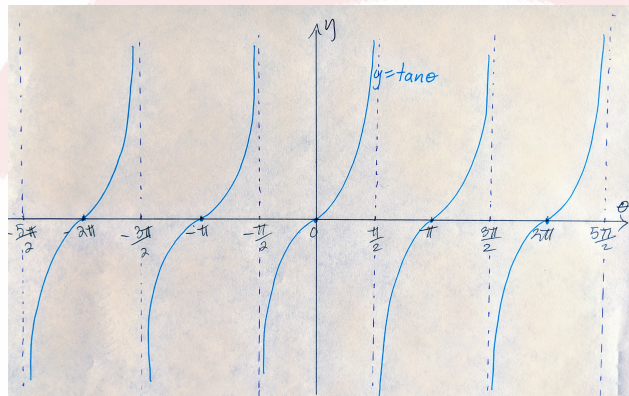
Graph of $\cos \theta$

θ	0	$\pi/2$	π	$3\pi/2$	2π
$\cos \theta$	1	0	-1	0	1



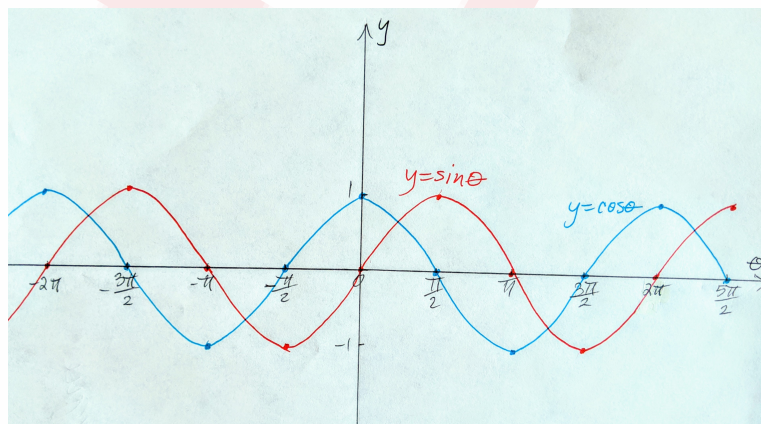
Graph of $\tan \theta$

θ	0	$\pi/4$	$\pi/2$	$3\pi/4$	π	$5\pi/4$	$3\pi/2$	$7\pi/4$	2π
$\tan \theta$	0	1	∞	-1	0	1	∞	-1	0



Notice that the function $y = \sin \theta$ and $y = \cos \theta$ are periodic functions that repeat a pattern over the interval $0 \leq \theta \leq 2\pi$. The length of this interval is called the *period* of the function and is 2π in this case. Notice that $y = \tan \theta$ has vertical asymptotes at odd multiples of π , that is when,

$$\theta = \pi/2, \text{ or } \theta = (2n - 1)\pi/2, n = \dots, -1, 0, 1, \dots$$



Exercises

1. Draw the graphs of the following functions. Angle measures are in radians.

(a) $\sin \theta$

(b) $3 \sin \theta$

(c) $-\sin \theta$

(d) $\sin \theta + 2$

(e) $\sin \theta - 3$

2. Draw graphs of the following functions. Angle measures are in radians.

(a) $\cos \theta + 2$

(b) $2 \cos \theta - 1$

(c) $-\cos\left(\theta + \frac{\pi}{2}\right)$

(d) $\cos(-\theta)$

(e) $\frac{1}{2} \cos\left(\theta - \frac{\pi}{4}\right) + 1$