Graphs of Trigonometric Functions

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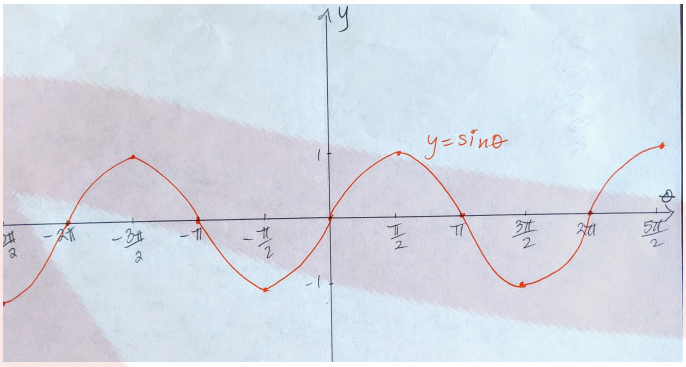
Graphs of trigonometric functions

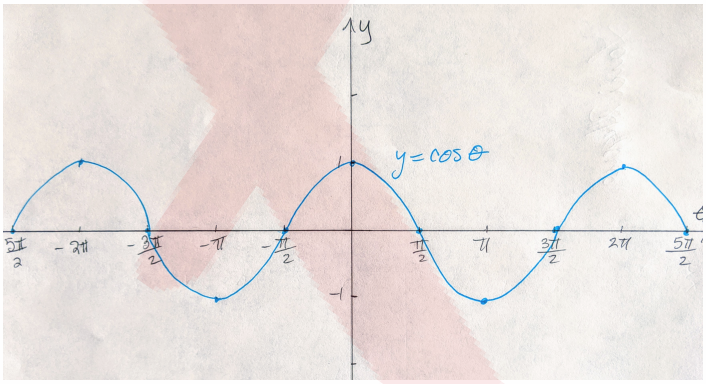
Graph of $\sin\theta$

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



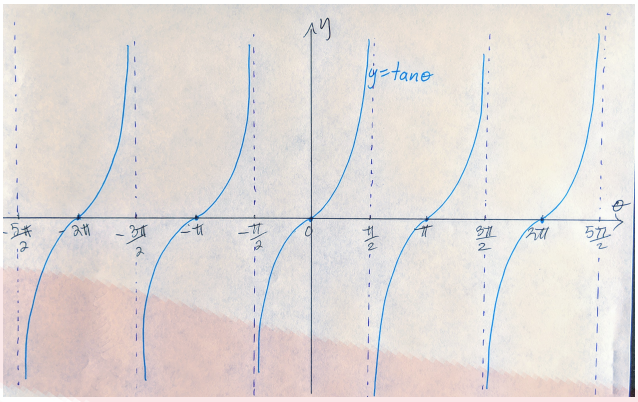
Graph of $\cos\theta$

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



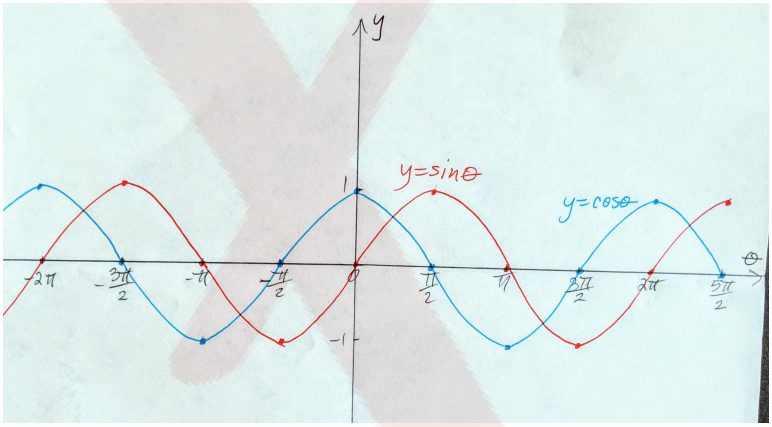
Graph of $\tan\theta$

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 patten 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,

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



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) $\sin\theta - 3$

   f) $\sin(2\theta)$

   g) $\frac{1}{2}\sin\theta$

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

   a) $\cos\theta + 2$

   b) $2\cos\theta - 1$

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

   d) $\cos(-\theta)$

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