

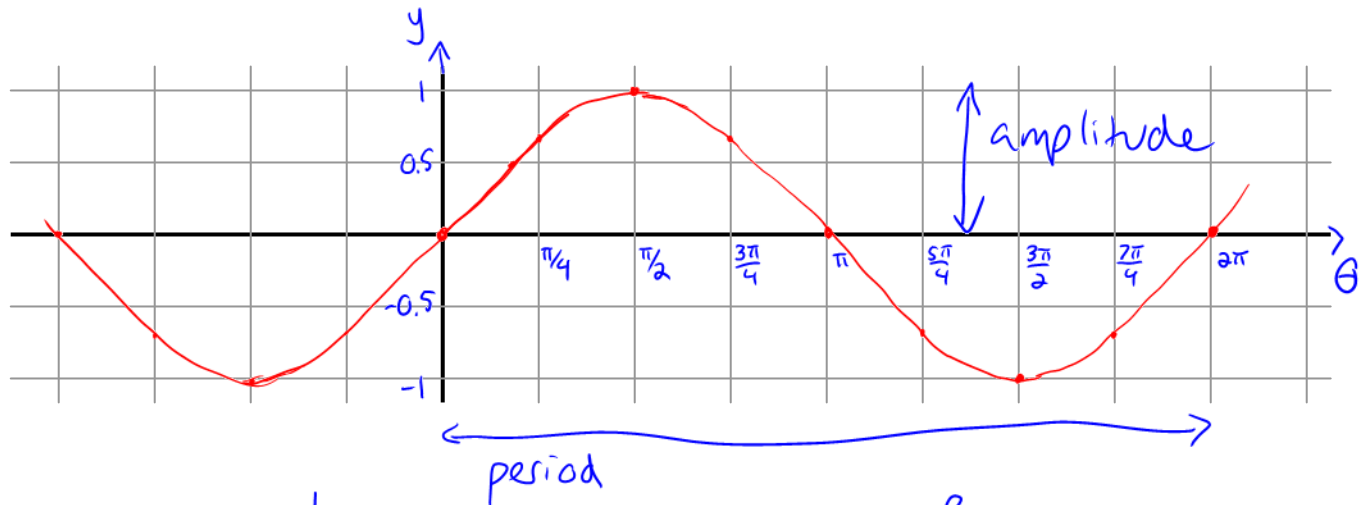
## Math 173 – Section 6.5: Graphs of Trig Functions

### Sine graph:

$\theta$		sin $\theta$
degrees	rads	
0°	0	0
30°	$\pi/6$	$1/2 = 0.5$
45°	$\pi/4$	$\sqrt{2}/2 \approx 0.71$
60°	$\pi/3$	$\sqrt{3}/2 \approx 0.87$
90°	$\pi/2$	1
120°	$2\pi/3$	0.87
135°	$3\pi/4$	0.71
150°	$5\pi/6$	0.5
180°	$\pi$	0

$\theta$		sin $\theta$
degrees	rads	
225°	$5\pi/4$	-0.71
270°	$3\pi/2$	-1
315°	$7\pi/4$	-0.71
360°	$2\pi$	0

Sketch:



amplitude: 1

domain:  $\mathbb{R}$

period:  $2\pi$

range:  $[-1, 1]$

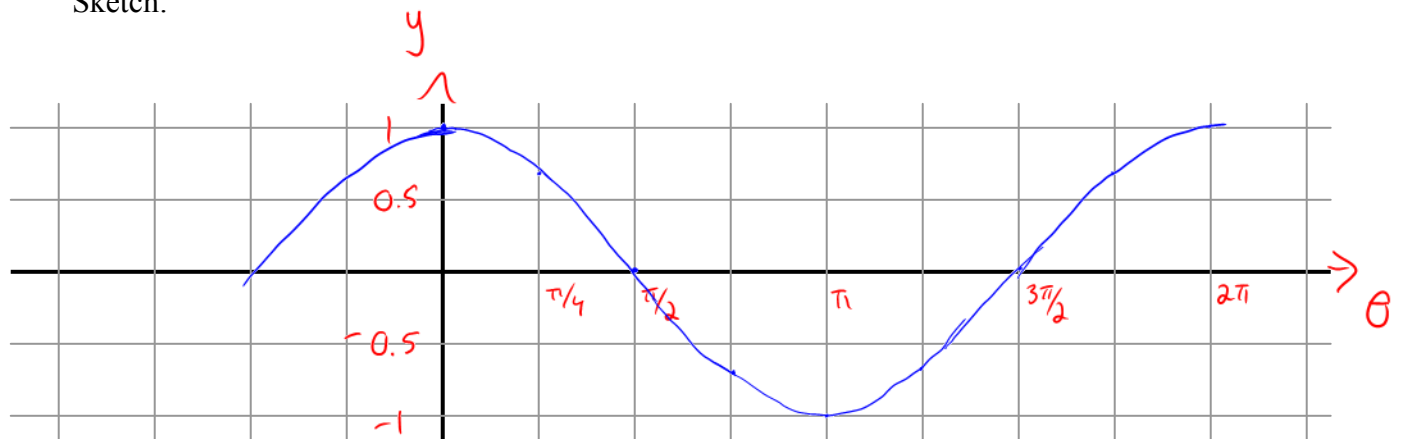
or  $\{y \mid -1 \leq y \leq 1\}$

**Cosine graph:**

$\theta$		$\cos \theta$
degrees	rads	
$0^\circ$	0	1
$30^\circ$		
$45^\circ$	$\pi/4$	0.71
$60^\circ$		
$90^\circ$	$\pi/2$	0
$120^\circ$		
$135^\circ$	$3\pi/4$	-0.71
$150^\circ$		
$180^\circ$	$\pi$	-1

$\theta$		$\cos \theta$
degrees	rads	
$225^\circ$		
$270^\circ$	$3\pi/2$	0
$315^\circ$		
$360^\circ$	$2\pi$	1

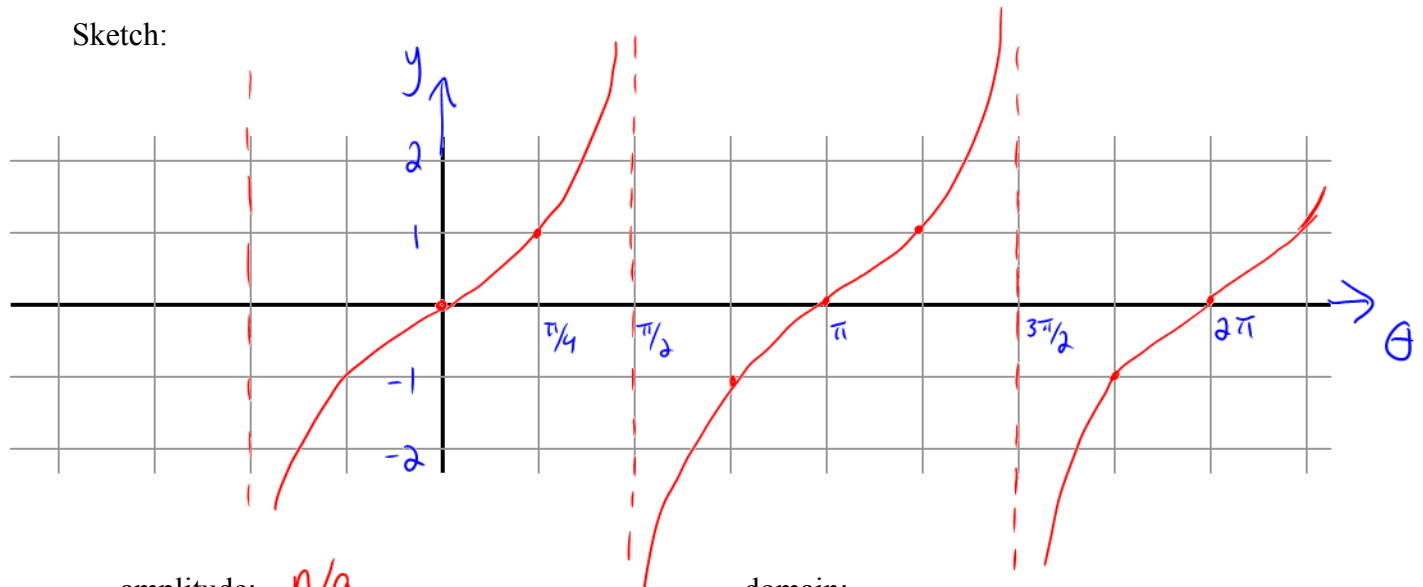
Sketch:

amplitude: 1domain:  $\mathbb{R}$ period:  $2\pi$ range:  $[-1, 1]$

**Tangent graph:**

$\theta$		$\tan \theta$
degrees	rads	
$0^\circ$	0	0
$45^\circ$	$\pi/4$	1
$90^\circ$	$\pi/2$	undef
$135^\circ$	$3\pi/4$	-1
$180^\circ$	$\pi$	0
$225^\circ$	$5\pi/4$	1
$270^\circ$	$3\pi/2$	undef
$315^\circ$	$7\pi/4$	-1
$360^\circ$	$2\pi$	0

Sketch:

amplitude: n/a

domain: \_\_\_\_\_

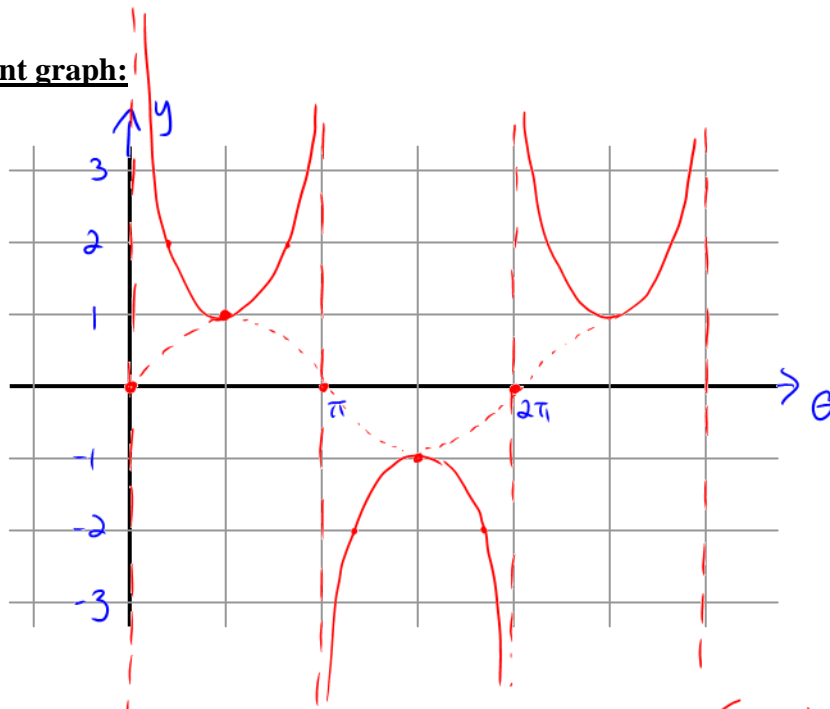
period:  $\pi$ range:  $\mathbb{R}$ 

domain:

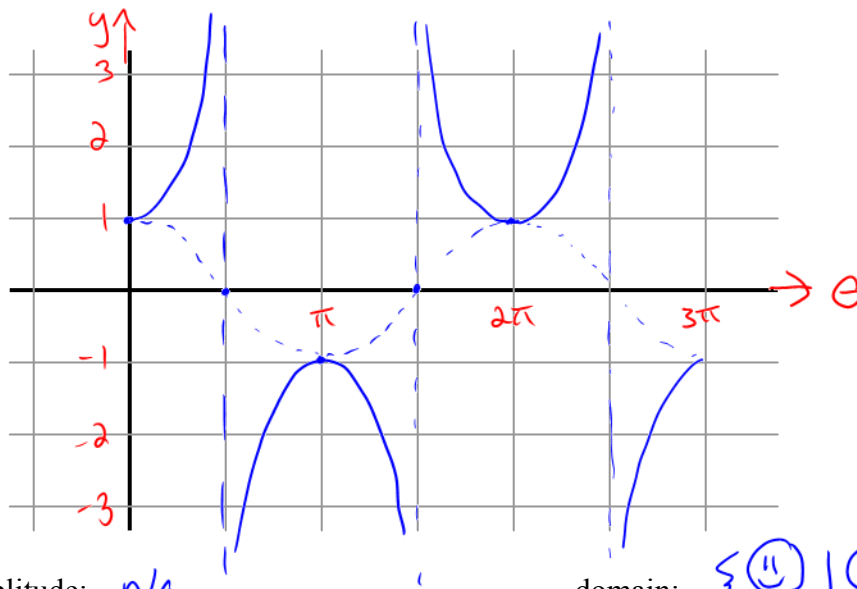
$$\left\{ \theta \mid \theta \neq \frac{n\pi}{2} \text{ where } n \text{ is an odd integer} \right\}$$

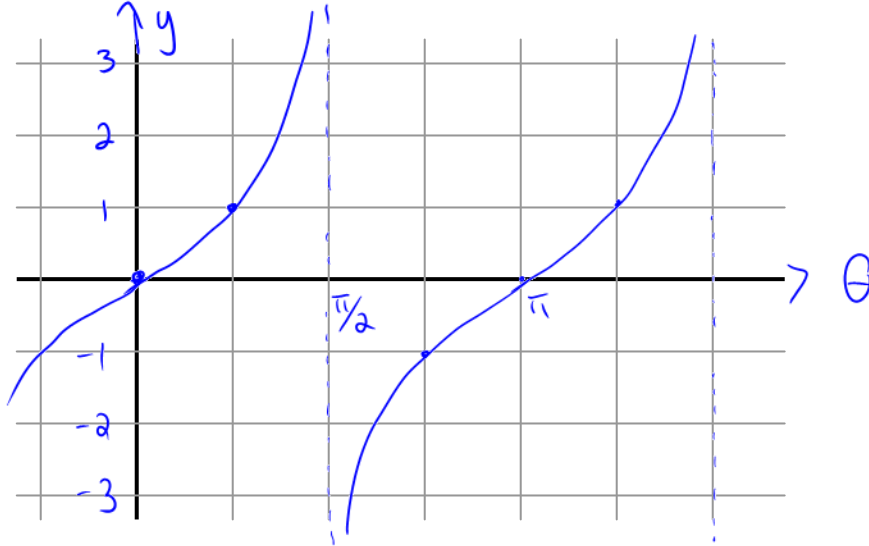
or

$$\left\{ \theta \mid \theta \neq \pm \frac{\pi}{2} \text{ and } \theta \neq \pm \frac{3\pi}{2} \text{ and } \theta \neq \pm \frac{5\pi}{2} \text{ and } \dots \right\}$$

**Cosecant graph:**

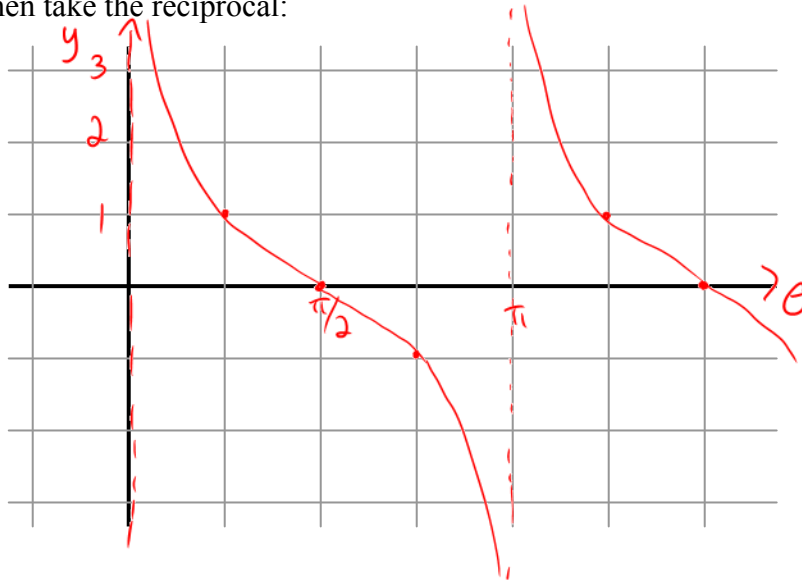
$$\csc \theta = \frac{1}{\sin \theta}$$

amplitude:  $n/a$ domain:  $\{\theta \mid \theta \neq n\pi, \text{ where } n \text{ is an integer}\}$ period:  $2\pi$ range:  $(-\infty, -1] \cup [1, \infty)$ **Secant graph:**amplitude:  $n/a$ domain:  $\{\theta \mid \theta \neq \frac{n\pi}{2} \text{ where } n \text{ is an odd integer}\}$ period:  $2\pi$ range:  $(-\infty, -1] \cup [1, \infty)$

**Cotangent graph:**First, sketch  $\tan \theta$ :

$$\cot \theta = \frac{1}{\tan \theta}$$

and then take the reciprocal:



so, everywhere  $\tan \theta = 0$ ,  $\cot \theta$  has an asymptote

and everywhere  $\tan \theta$  has an asymptote,  $\cot \theta = 0$

amplitude:  $\frac{n}{a}$ domain:  $\{\theta \mid \theta \neq n\pi \text{ where } n \text{ is an integer}\}$ period:  $\pi$ range:  $\mathbb{R}$