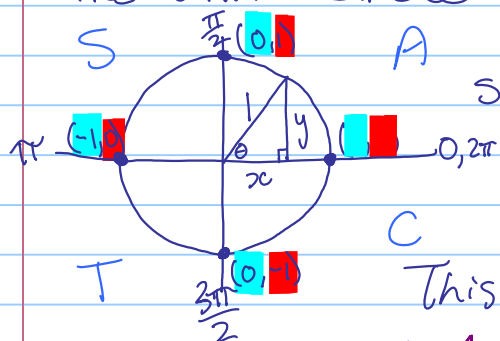


# G.4/6.5 Sine, Cosine & Tangent Graphs

Note Title

26/11/2012

The unit circle:

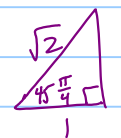
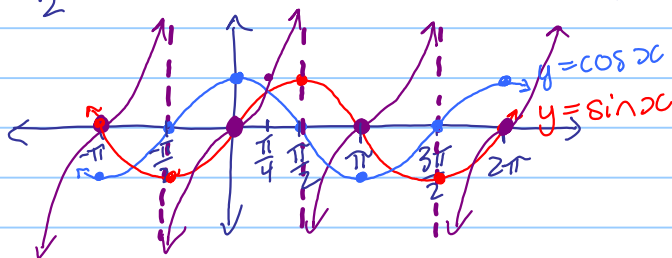


$$\sin \theta = y \quad \cos \theta = x \quad \tan \theta = \frac{y}{x}$$

$$\therefore \tan \theta = \frac{\sin \theta}{\cos \theta}$$

← zeros are still zeros  
← zeros become asymptotes

This is called the quotient identity.



The period of tangent is  $\pi$ .

$$D: x \neq \frac{\pi}{2}, \frac{3\pi}{2}, \dots \Rightarrow x \neq \frac{\pi}{2} + \pi n, n \in \mathbb{Z}$$

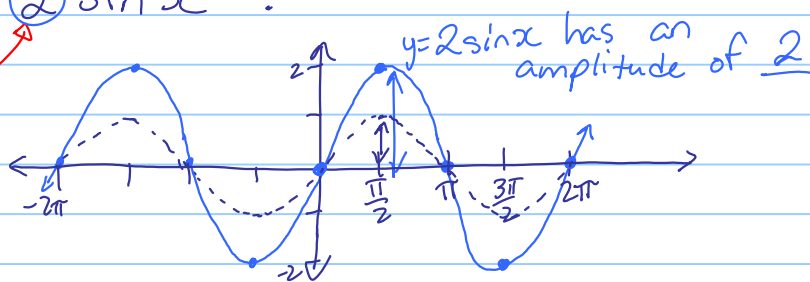
↑ start  
↑ how far apart (period)

$$R: y \in \mathbb{R}$$

How could we draw the graph of

$$y = 2 \sin x?$$

vertical expansion by 2

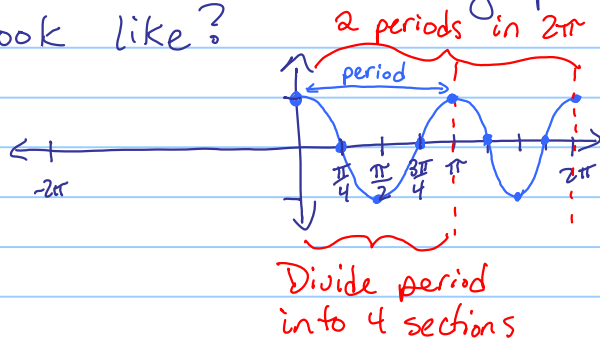


What would the amplitude of  $y = -3 \cos x$  be?

reflection amplitude is 3

The amplitude of  $y = a \sin x$  or  $y = a \cos x$  is  $|a|$ .

What would the graph of  $y = \cos(2x)$  look like?



also called frequency

horizontally compressed by  $\frac{1}{2}$   
so one period will be  $\frac{1}{2}(2\pi) = \pi$

What is the period of  $y = \sin \frac{1}{4}x$ ?

$$4(2\pi) = 8\pi$$

The period of  $y = \sin bx$  or  $y = \cos bx$  is  $\frac{1}{b}(2\pi)$  or  $\boxed{\frac{2\pi}{b}}$ .

What is the period of  $y = \tan bx$ ?

$$\boxed{\frac{\pi}{b}}$$