

**Use link on website to print the blank graphs!**

#1-6: Carefully sketch the 6 trig functions.

#7-16: Given that  $-2\pi \leq x \leq 2\pi$ , find the values of  $x$  that make each statement true.

7.  $\sin x = 0$

8.  $\sin^{-1}(1)$

9.  $\cos x = 0$

10.  $\arccos(1)$

11.  $\tan x = -1$

12.  $\arctan(0)$

13.  $\sec x = \text{undefined}$

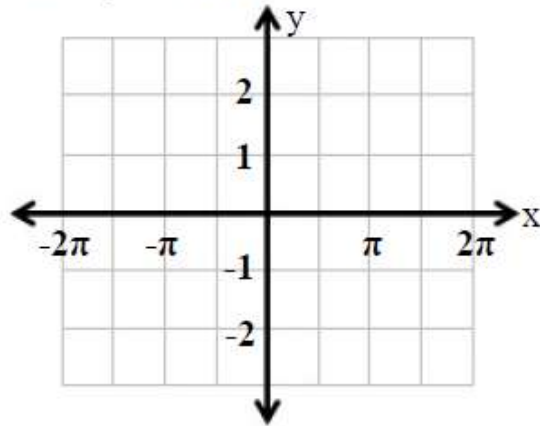
14.  $\tan^{-1}(1)$

15.  $\csc x = -1$

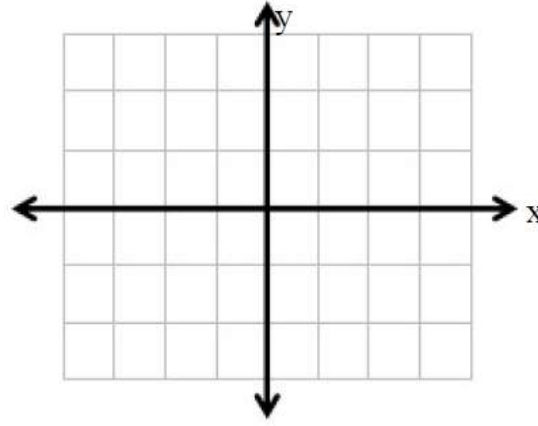
16.  $\cot x = 0$

# Quiz yourself...see if you can sketch the graphs without looking at previous handouts!

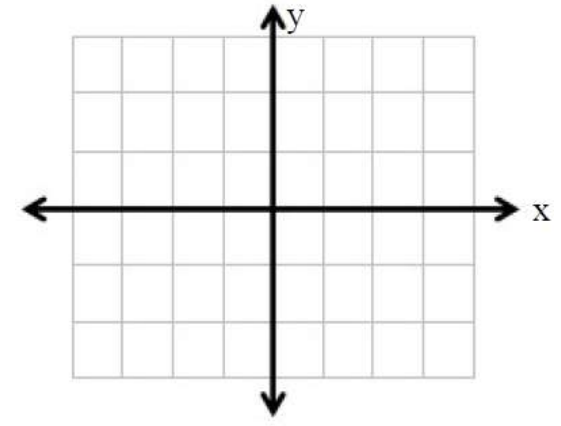
1.  $y = \sin x$



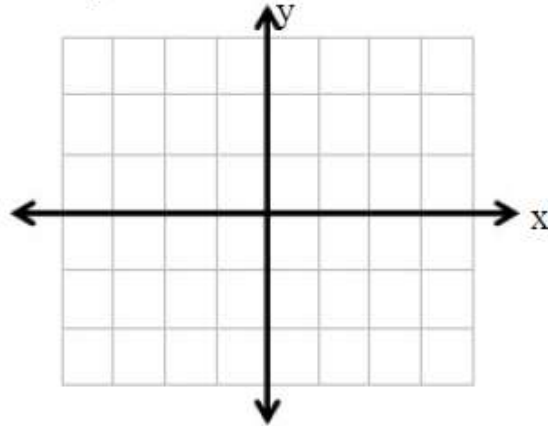
3.  $y = \cos x$



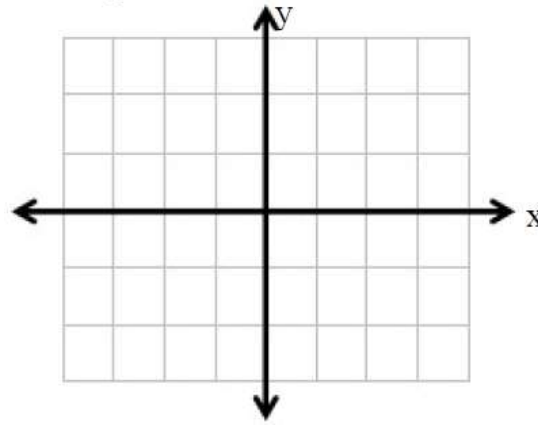
5.  $y = \tan x$



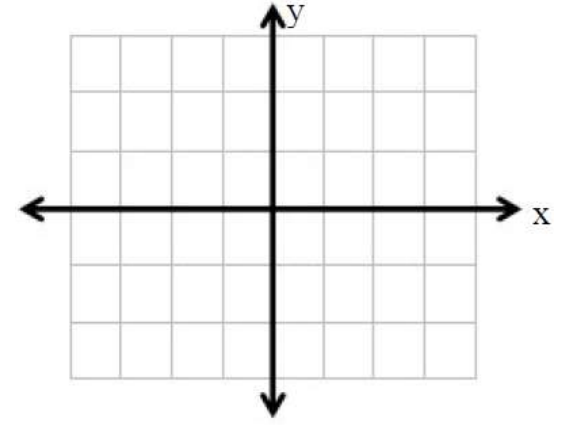
2.  $y = \csc x$



4.  $y = \sec x$

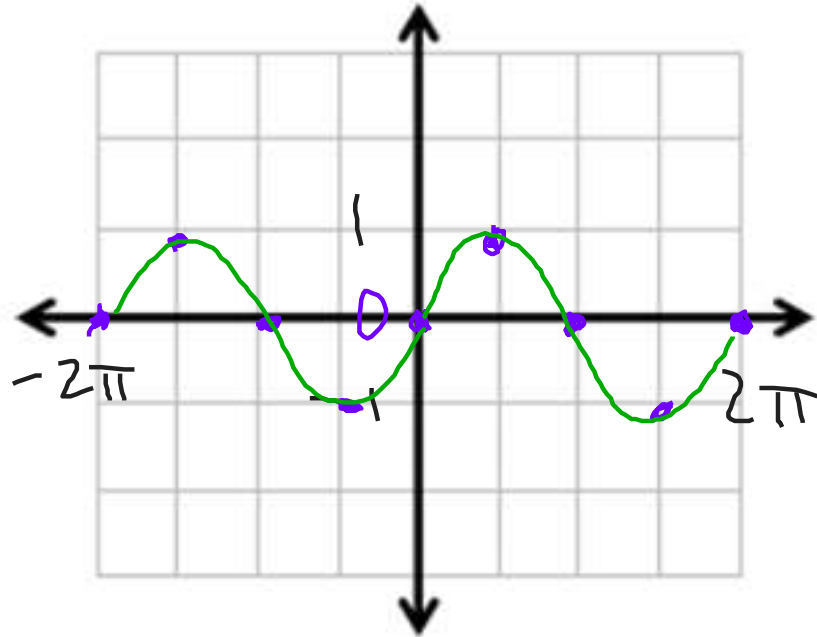


6.  $y = \cot x$

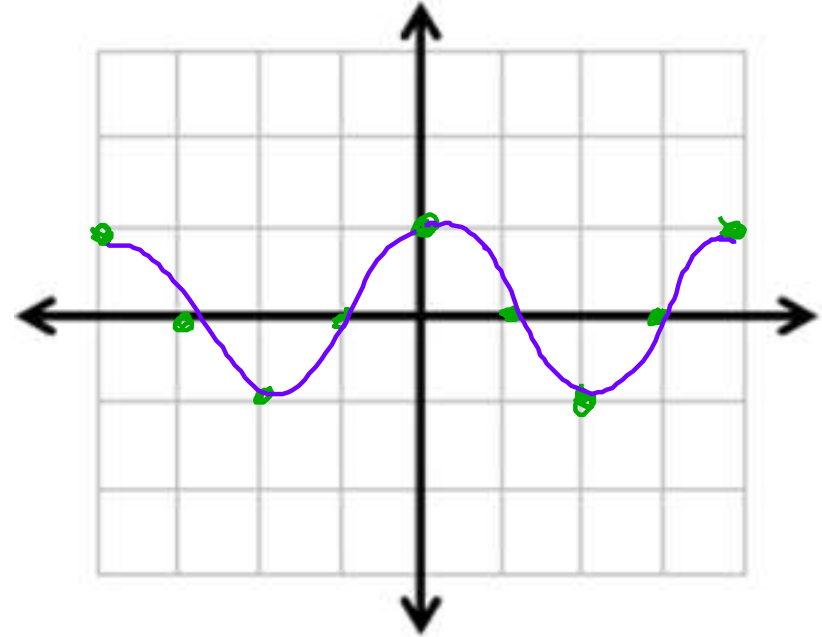


Keep scrolling for graph keys and principal values!

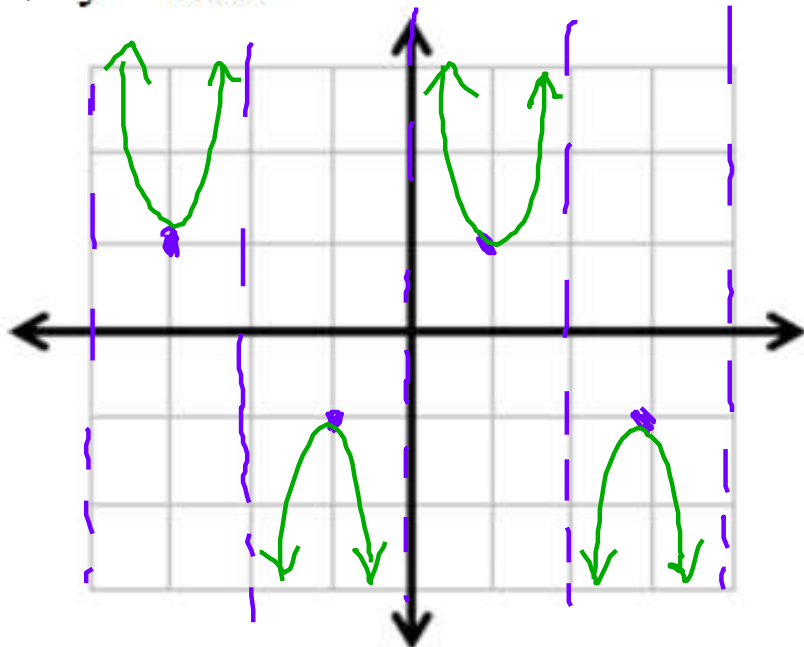
1.  $y = \sin x$



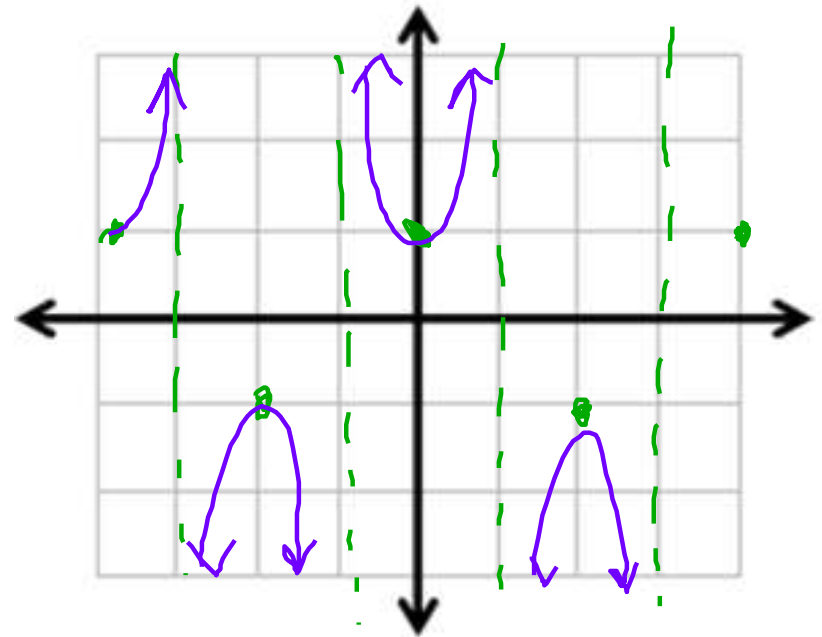
3.  $y = \cos x$



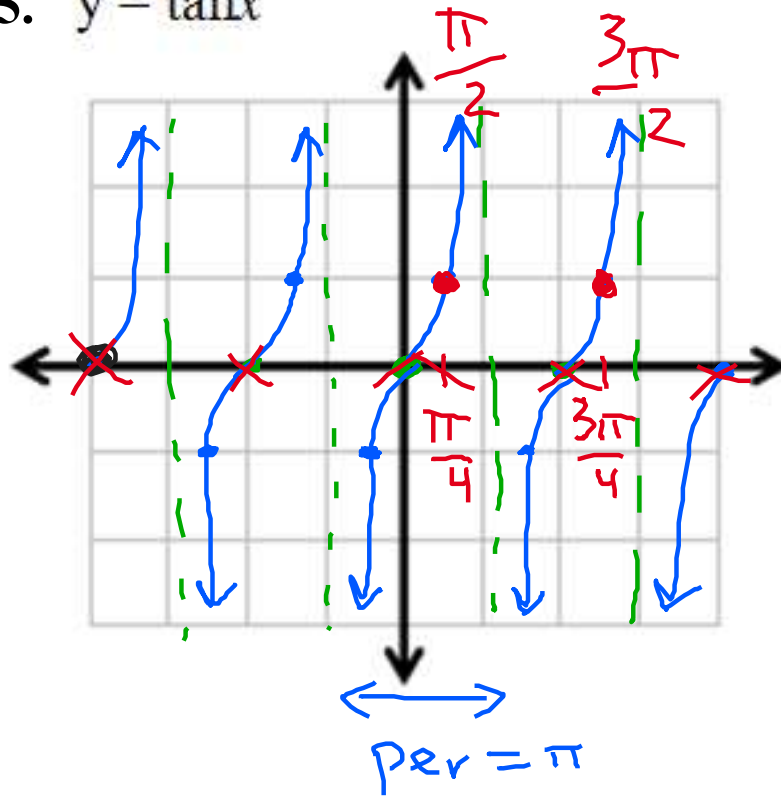
2.  $y = \csc x$



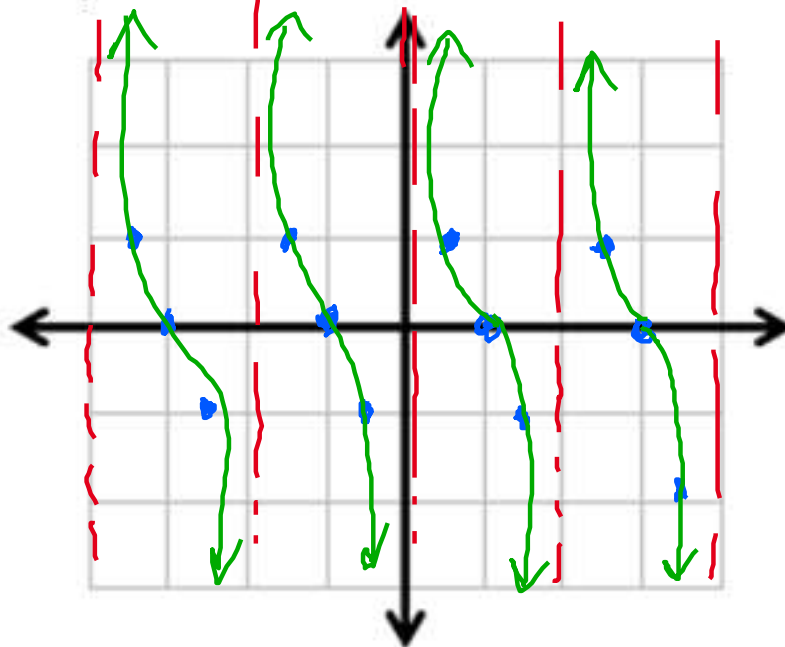
4.  $y = \sec x$



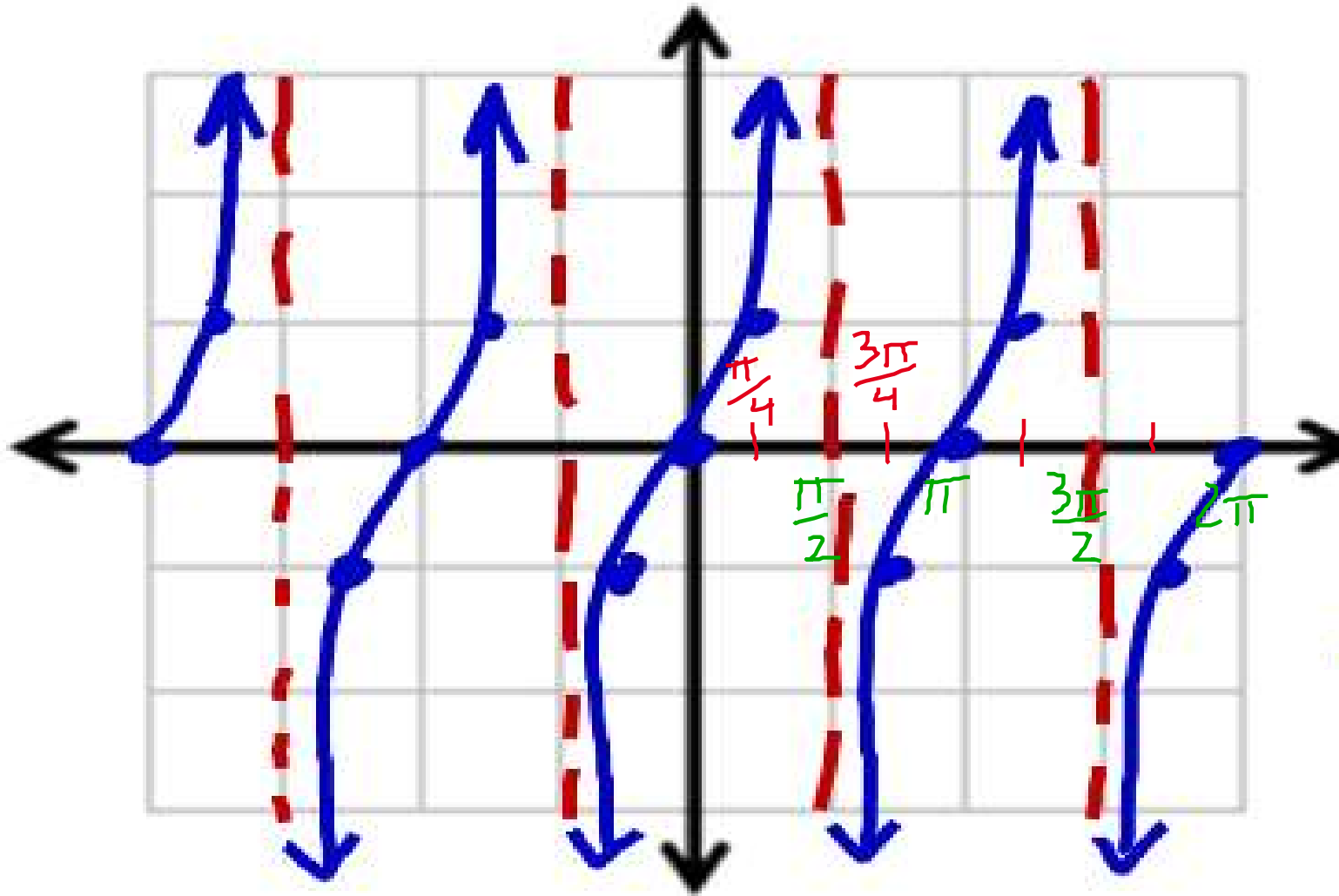
5.  $y = \tan x$



6.  $y = \cot x$



$$y = \tan x$$



**More values for the tangent graph...know how to identify them for the group quiz and unit test.**

**Reminder: find ALL solutions for the given interval.**

#7-16: Given that  $-2\pi \leq x \leq 2\pi$ , find the values of  $x$  that make each statement true.

7.  $\sin x = 0$

$-2\pi, -\pi, 0, \pi, 2\pi$

9.  $\cos x = 0$

11.  $\tan x = -1$

13.  $\sec x = \text{undefined}$

15.  $\csc x = -1$

8.  $\sin^{-1}(1)$

$\sin x = 1$

$-\frac{3\pi}{2}, \frac{\pi}{2}$

rewrite

10.  $\arccos(1)$

$\cos x = 1$

12.  $\arctan(0)$

$\tan x = 0$

14.  $\tan^{-1}(1)$

$\tan x = 1$

16.  $\cot x = 0$

# ✓ CHECK YOUR ANSWERS!!!!

7.  $-2\pi, -\pi, 0, \pi, 2\pi$

8.  $\frac{-3\pi}{2}, \frac{\pi}{2}$

9.  $\frac{-3\pi}{2}, \frac{-\pi}{2}, \frac{\pi}{2}, \frac{3\pi}{2}$

10.  $-2\pi, 0, 2\pi$

11.  $\frac{-5\pi}{4}, \frac{-\pi}{4}, \frac{3\pi}{4}, \frac{7\pi}{4}$

12.  $-2\pi, -\pi, 0, \pi, 2\pi$

13.  $\frac{-3\pi}{2}, \frac{-\pi}{2}, \frac{\pi}{2}, \frac{3\pi}{2}$

14.  $\frac{-7\pi}{4}, \frac{-3\pi}{4}, \frac{\pi}{4}, \frac{5\pi}{4}$

15.  $\frac{-\pi}{2}, \frac{3\pi}{2}$

16.  $\frac{-3\pi}{2}, \frac{-\pi}{2}, \frac{\pi}{2}, \frac{3\pi}{2}$

# Reminder for today's bookwork!!

## NOTES: 6.4 Solving for angles using inverses

Principal values create a unique (one) solution:

$\sin\theta$  and  $\tan\theta \rightarrow$  Quadrant I (+)

Quadrant IV (-)

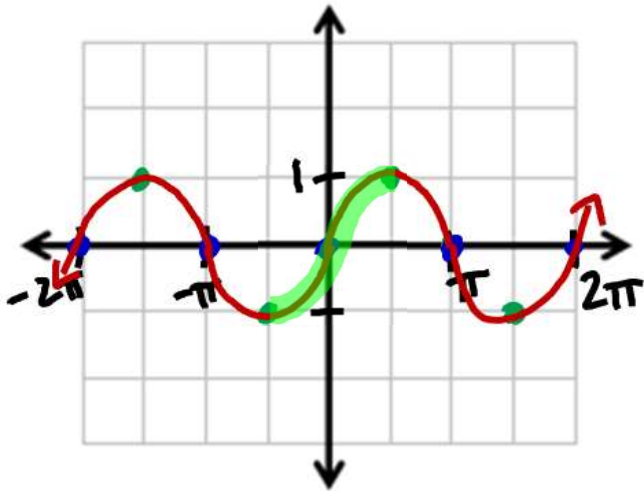
$\cos\theta \rightarrow$  Quadrant I (+)

Quadrant II (-)



# Highlight Principal Values for today's book work

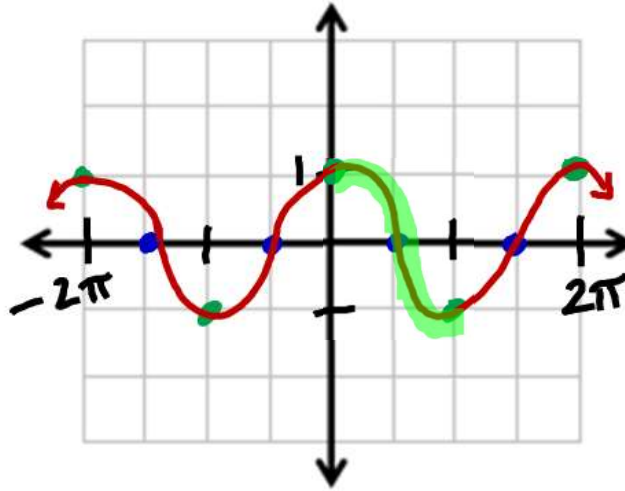
$$y = \sin x$$



$$-\frac{\pi}{2} \leq x \leq \frac{\pi}{2}$$

Quadrants I and IV

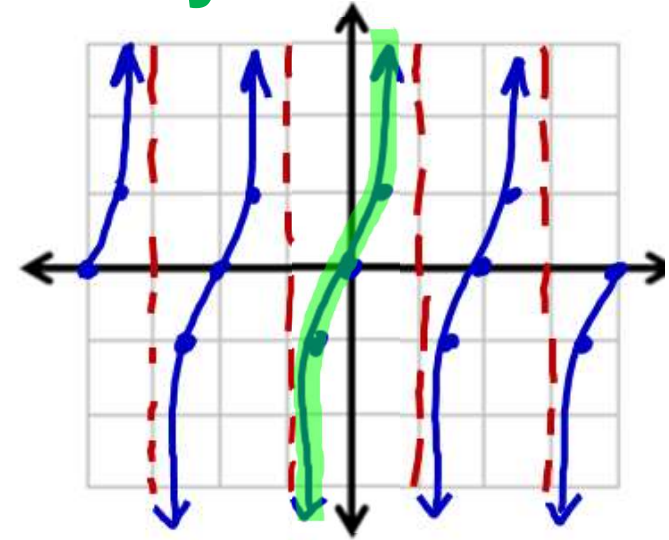
$$y = \cos x$$



$$0 \leq x \leq \pi$$

Quadrants I and II

$$y = \tan x$$



$$-\frac{\pi}{2} \leq x \leq \frac{\pi}{2}$$

Quadrants I and IV

**To solve 5.5 #4, 6, 8-10, 43-48**

**ONLY use values from the green highlighted regions in order to have a unique solution.**

There are multiple solutions for #7-16 since you are given the interval from  $-2\pi$  to  $2\pi$

**Check answers: warm up #7-16**

$$-2\pi \quad -2\pi \quad -2\pi \quad -\pi \quad -\pi \quad 0 \quad 0 \quad 0 \quad \pi \quad \pi \quad 2\pi \quad 2\pi \quad 2\pi$$

$$-\frac{3\pi}{2} \quad -\frac{3\pi}{2} \quad -\frac{3\pi}{2} \quad -\frac{3\pi}{2} \quad -\frac{\pi}{2} \quad -\frac{\pi}{2} \quad -\frac{\pi}{2} \quad -\frac{\pi}{2}$$

$$\frac{\pi}{2} \quad \frac{\pi}{2} \quad \frac{\pi}{2} \quad \frac{\pi}{2} \quad \frac{3\pi}{2} \quad \frac{3\pi}{2} \quad \frac{3\pi}{2} \quad \frac{3\pi}{2}$$

$$-\frac{7\pi}{4} \quad -\frac{5\pi}{4} \quad -\frac{3\pi}{4} \quad -\frac{\pi}{4} \quad \frac{\pi}{4} \quad \frac{3\pi}{4} \quad \frac{5\pi}{4} \quad \frac{7\pi}{4}$$

**5.5 #4,6, 8-10, 43-48**

→ use principal values

(see notes 6.4 and unit circle ws #1-50)

Principal values are used so there is only one unique solution.

$\sin x, \tan x \rightarrow$  Quadrants I and IV

$\cos x \rightarrow$  Quadrants I and II

**CHECK ANSWERS (evens & odds included)**

$$\text{undefined} \quad 0 \quad 0 \quad 0 \quad 1 \quad 1$$

$$\frac{-\sqrt{3}}{2} \quad \frac{-\sqrt{2}}{2} \quad \frac{\sqrt{3}}{3} \quad \frac{1}{2} \quad \frac{-\pi}{2} \text{ (same as } \frac{3\pi}{2} \text{)}$$

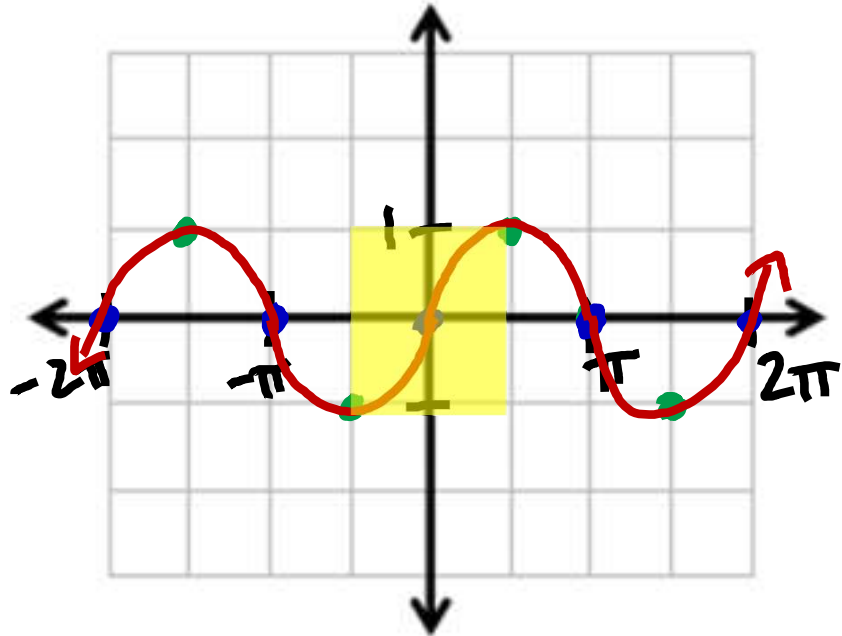
$$\frac{-\pi}{3} \text{ (same as } \frac{5\pi}{3} \text{)} \quad \frac{-\pi}{4} \text{ (same as } \frac{7\pi}{4} \text{)}$$

$$\frac{-\pi}{6} \text{ (same as } \frac{11\pi}{6} \text{)} \quad \frac{-\pi}{6} \text{ (same as } \frac{11\pi}{6} \text{)}$$

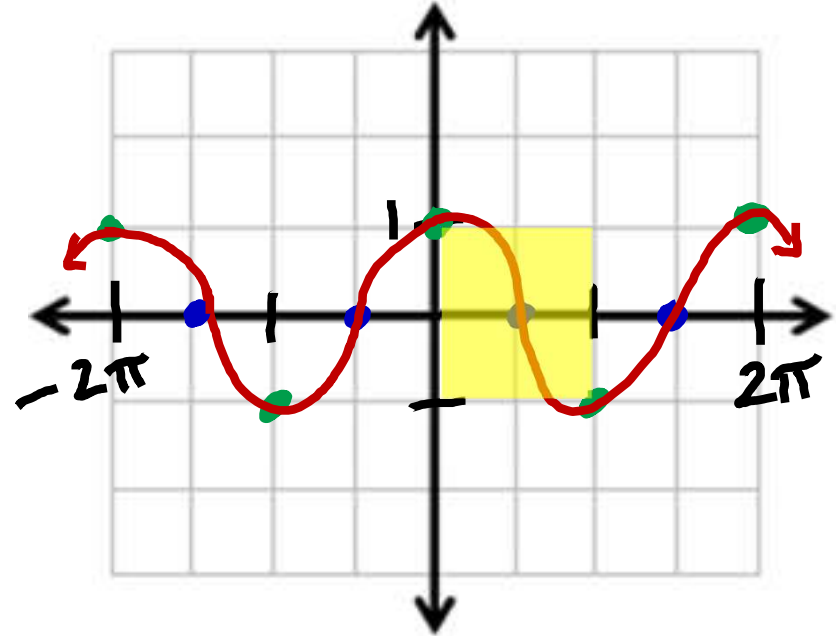
$$\frac{\pi}{2} \quad \frac{\pi}{4} \quad \frac{\pi}{4} \quad \frac{\pi}{4} \quad \frac{2\pi}{3} \quad \frac{3\pi}{4}$$

←The book is expecting one unique solution so you must use principal values!

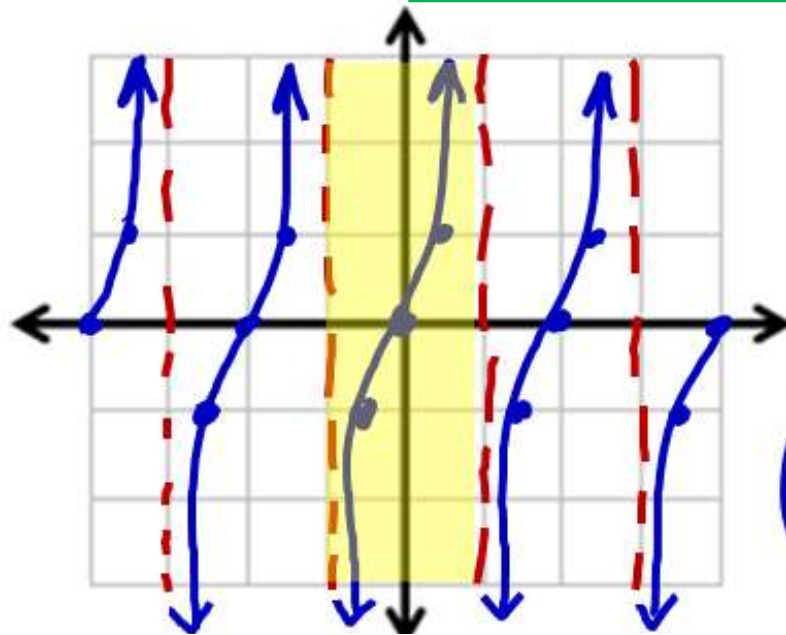
$$y = \sin x$$



$$y = \cos x$$



$$y = \tan x$$



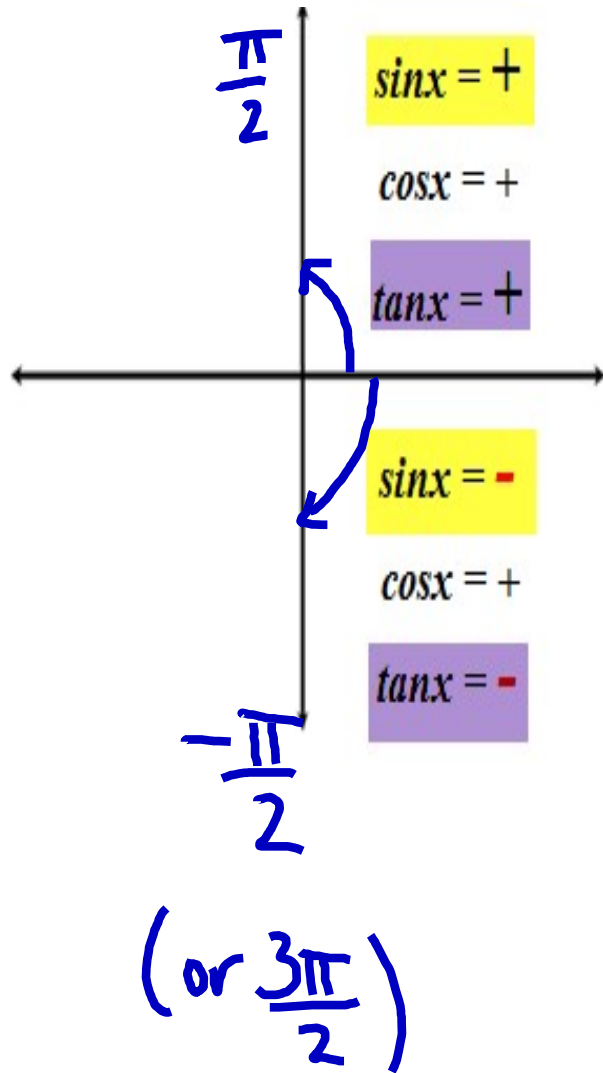
Principal values are highlighted

$$\left(-\frac{\pi}{4}, -1\right) \quad (0, 0) \quad \left(\frac{\pi}{4}, 1\right)$$

$$\left. \begin{array}{l} \sin x \\ \tan x \end{array} \right| -\frac{\pi}{2} \leq x \leq \frac{\pi}{2}$$

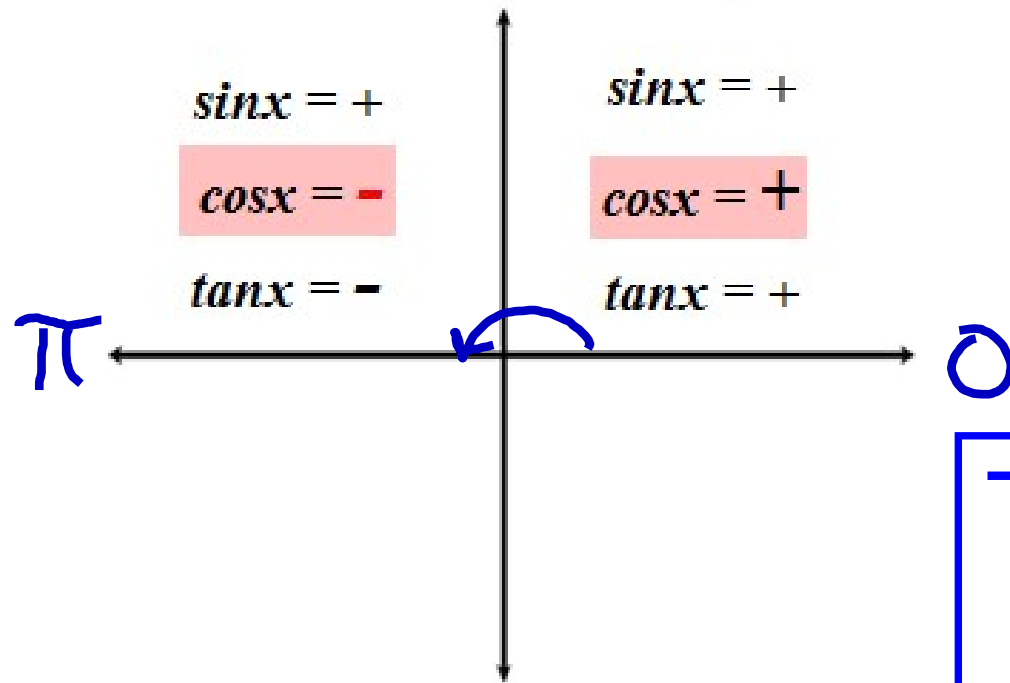
*Quadrants I, IV*

# Principal Values



There is only one set of positive and negative values for the given quadrants.

$\cos x \} 0^\circ \leq x \leq \pi$       *Quadrants I, II*



**Principal Values**

There is only one set of positive and negative values for the given quadrants.