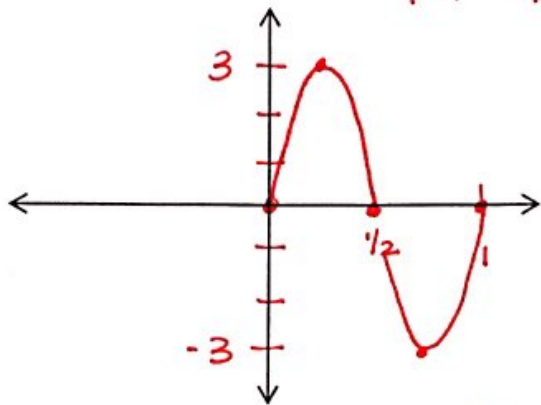


Non-Calculator

Graph ONE complete cycle of the following. Make sure you label your x and y axes.

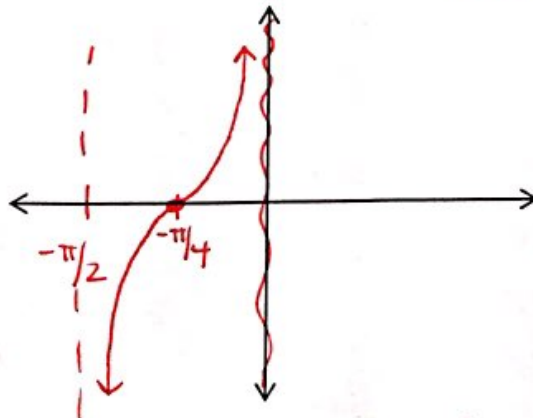
1.  $y = 3 \sin 2\pi x$

amp = 3  
per =  $\frac{2\pi}{2\pi} = 1$



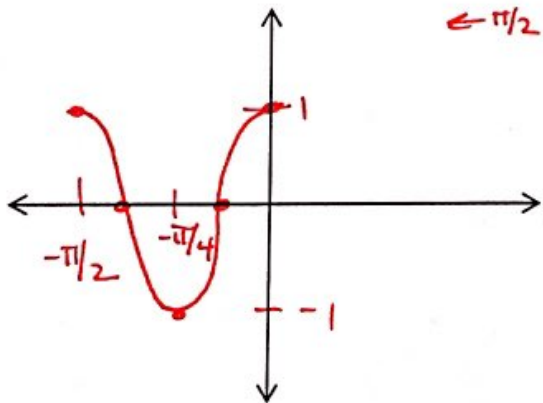
2.  $y = \tan 2(x + \frac{\pi}{4})$

per =  $\frac{\pi}{2}$  ( $-\pi/4 \rightarrow \pi/4$ )  
←  $\pi/4$  ( $-\pi/2 \rightarrow 0$ )



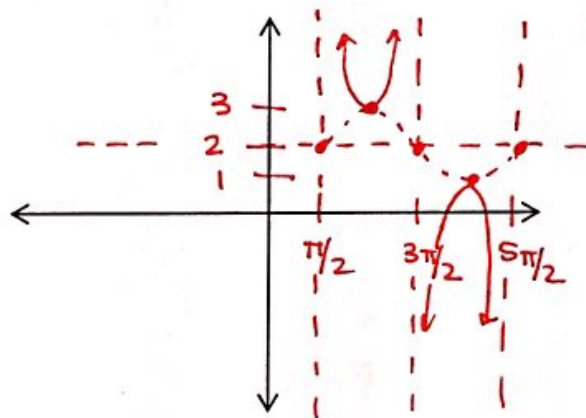
3.  $y = \cos 4(x + \frac{\pi}{2})$

per =  $\frac{2\pi}{4} = \pi/2$   
0 → π/2  
← π/2 ( $-\pi/2 \rightarrow 0$ )



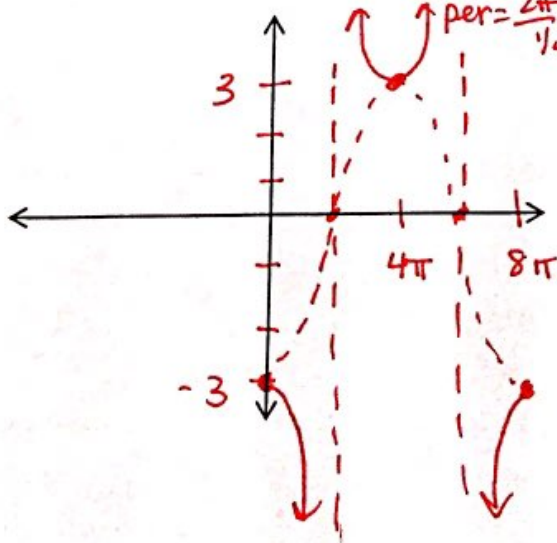
4.  $y = \csc(x - \frac{\pi}{2}) + 2$

→ π/2 π/2 → 5π/2  
↑ 2



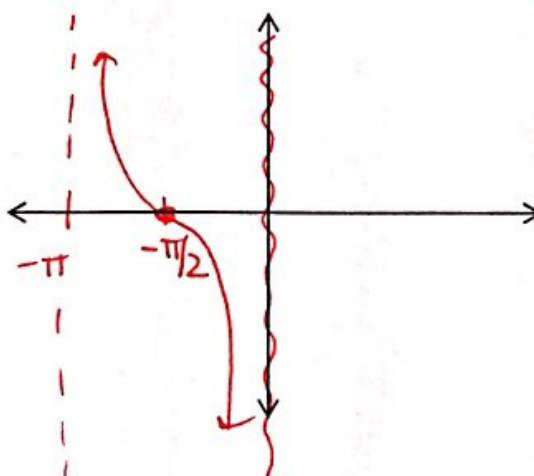
5.  $y = -3 \sec(\frac{x}{4})$

cos   
amp = 3  
per =  $\frac{2\pi}{1/4} = 8\pi$

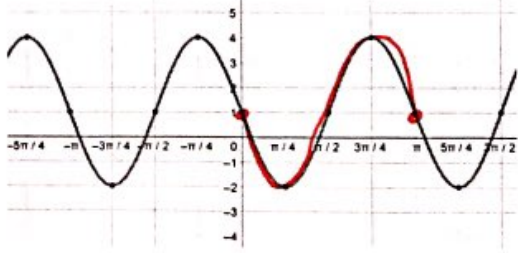


6.  $y = \cot(x + \pi)$

← π -π → 0



7. Write an equation for the following graph.



$$y = -3\sin(2x) + 1$$

Per =  $\pi$   
 $\frac{2\pi}{b} = \pi$        $b = 2$

∴ There are other possible answers.

8. Solve for  $\theta$ .

a.  $\cos \theta = -\frac{\sqrt{3}}{2}$      $180^\circ \leq \theta < 270^\circ$   
 Q III  
 ref  $\angle = 30^\circ$   
 $\theta = 210^\circ$

b.  $\sin \theta = \frac{1}{2}$      $90^\circ \leq \theta < 180^\circ$   
 Q II  
 ref  $\angle = 30^\circ$   
 $\theta = 150^\circ$

c.  $\tan \theta = -\sqrt{3}$      $\frac{\pi}{2} \leq \theta < \pi$   
 ref  $\angle = \pi/3$   
 Q II  
 $\theta = 2\pi/3$

9. Evaluate the following.

a.  $\tan \frac{\pi}{2}$   
 (0, 1)  
 $\frac{1}{0} = \text{undef}$

b.  $\cos \frac{\pi}{4} = \frac{\sqrt{2}}{2}$   
 Q: I  
 ref =  $45^\circ$

c.  $\sec(-\frac{7\pi}{6}) = -\frac{2\sqrt{3}}{3}$   
 Q: II  
 ref  $\angle = \pi/6 (30^\circ)$   
 $\cos(-\frac{7\pi}{6}) = -\frac{\sqrt{3}}{2}$

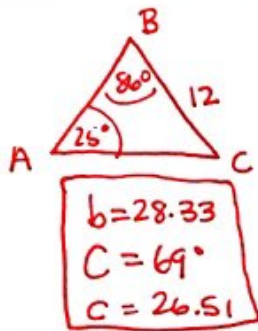
d.  $\sin \pi = 0$   
 (-1, 0)

**CALCULATOR.**

Solve the following triangles. Show all work.

Round answers to 2 decimal places.

10.  $A = 25^\circ, B = 86^\circ, a = 12$



$$\frac{b}{\sin 86^\circ} = \frac{12}{\sin 25^\circ}$$

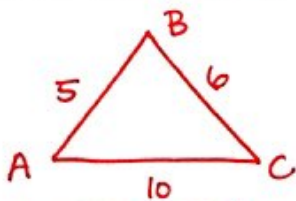
$$b = \frac{12 \sin 86^\circ}{\sin 25^\circ} = 28.33$$

$$C = 180^\circ - 86^\circ - 25^\circ = 69^\circ$$

$$\frac{c}{\sin 69^\circ} = \frac{12}{\sin 25^\circ}$$

$$c = \frac{12 \sin 69^\circ}{\sin 25^\circ} = 26.51$$

11.  $A = 6, b = 10, c = 5$



$A = 27.13^\circ$   
 $B = 130.54^\circ$   
 $C = 22.33^\circ$

$$10^2 = 5^2 + 6^2 - 2(5)(6) \cos B$$

$$39 = -60 \cos B$$

$$\frac{39}{-60} = \cos B$$

$$B = \cos^{-1}\left(\frac{39}{-60}\right) = 130.54^\circ$$

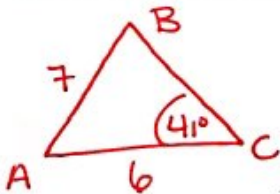
$$\frac{\sin A}{6} = \frac{\sin 130.54^\circ}{10}$$

$$A = \sin^{-1}\left(\frac{6 \sin 130.54^\circ}{10}\right) = 27.13^\circ$$

$$C = 180^\circ - 130.54^\circ - 27.13^\circ$$

✗ Remember to be careful with Law of Sines.  
 Do NOT use Law of Sines to find largest angle.

12.  $C = 41^\circ, c = 7, b = 6$



$A = 104.78^\circ$   
 $B = 34.22^\circ$   
 $a = 10.32$

$$\frac{\sin B}{6} = \frac{\sin 41^\circ}{7}$$

$$B = \sin^{-1}\left(\frac{6 \sin 41^\circ}{7}\right) = 34.22^\circ$$

*only 1 Δ,  $\frac{145.78^\circ}{180^\circ} = \text{ok}$*

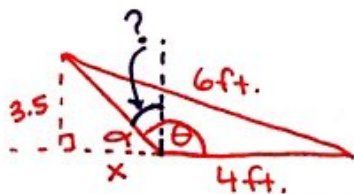
$$\frac{a}{\sin 104.78^\circ} = \frac{7}{\sin 41^\circ}$$

$$a = \frac{7 \sin 104.78^\circ}{\sin 41^\circ} = 10.32$$

SSA - 2 Δ's???

13. After a wind storm the small tree in my neighbor's yard was leaning. To keep it from falling, we nailed a 6-foot strap into the ground 4 feet away from the base of the tree. We attached the strap to a point on the tree that was  $3\frac{1}{2}$  feet above the ground. How far from vertical was the tree leaning?

Draw a picture and show your work.



✗ use "big" right Δ to find x.

①  $(x+4)^2 + (3.5)^2 = 6^2$

$$(x+4)^2 = 23.75$$

$$x+4 = \sqrt{23.75}$$

$$x = \sqrt{23.75} - 4 = .873397$$

✗ use "small" right Δ to find α.

②  $\tan \alpha = \frac{3.5}{.873397}$

$$\alpha = \tan^{-1}\left(\frac{3.5}{.873397}\right) = 75.988^\circ$$

③  $\theta = 180^\circ - \alpha = 180^\circ - 75.988^\circ = 104.012^\circ$

angle from vertical =  $104.012^\circ - 90^\circ = 14.012^\circ$