

Quiz # 2

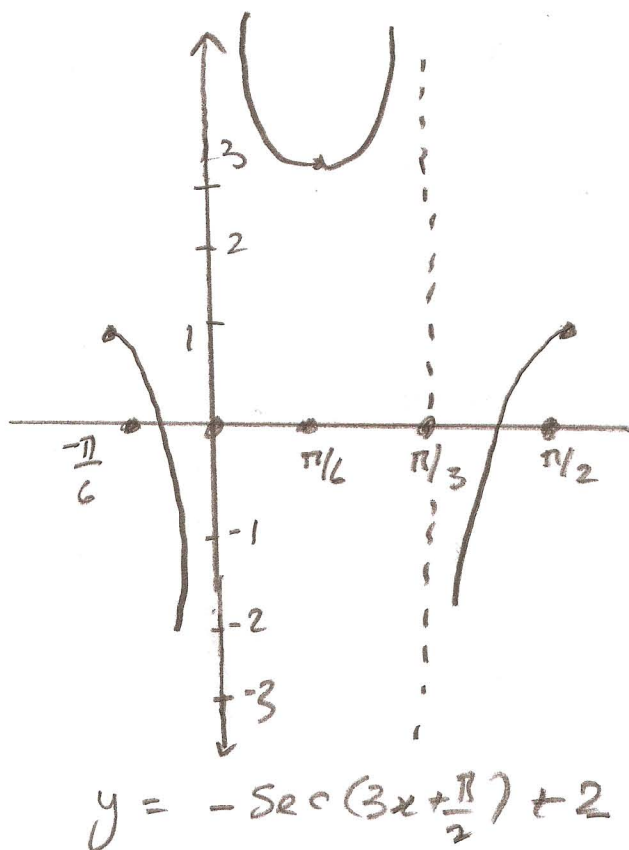
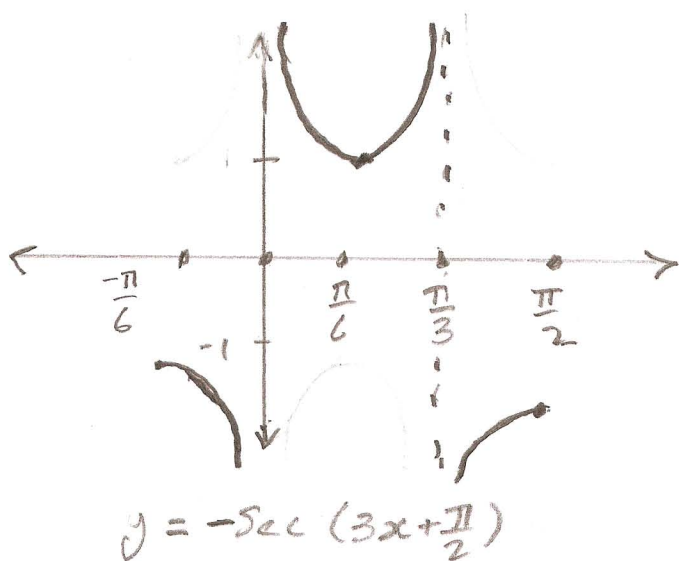
Solution:

Question 1 Graph $y = -\sec(3x + \frac{\pi}{2}) + 2$ over one period.

$$\text{Period} = \frac{2\pi}{b} = \frac{2\pi}{3}$$

$$\text{Phase-Shift: } -\frac{c}{b} = -\frac{(\pi/2)}{3} = -\frac{\pi}{6}$$

0	$\frac{\pi}{2b}$	$\frac{\pi}{b}$	$\frac{3\pi}{2b}$	$\frac{2\pi}{b}$
↓	↓	↓	↓	↓
0	$\frac{\pi}{6}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$	$\frac{2\pi}{3}$
↓	↓	↓	↓	↓
$-\frac{\pi}{6}$	0	$\frac{\pi}{6}$	$\frac{\pi}{3}$	$\frac{\pi}{2}$



Question # 2

$f(x) = 2 \tan\left(\frac{x}{2} - \frac{\pi}{8}\right)$. Find the x -int.
over the interval $\left[-\frac{7\pi}{4}, \frac{9\pi}{4}\right]$.

$$\sin\left(\frac{x}{2} - \frac{\pi}{8}\right) = 0$$

$$\frac{x}{2} - \frac{\pi}{8} = n\pi \quad ; \quad n \in \text{Integer.}$$

$$\frac{x}{2} = n\pi + \frac{\pi}{8}$$

$$x = 2n\pi + \frac{\pi}{4} = \frac{(8n+1)\pi}{4}$$

$$n = -1 \Rightarrow x = -\frac{7\pi}{4}$$

$$n = 0 \Rightarrow x = \frac{\pi}{4}$$

$$n = 1 \Rightarrow x = \frac{9\pi}{4}$$

Question # 3

$$\begin{aligned} \cos 285 &= \cos 75 = \cos(45^\circ + 30^\circ) \\ &= \cos 45^\circ \cos 30^\circ - \sin 45^\circ \sin 30^\circ \\ &= \left(\frac{\sqrt{2}}{2}\right)\left(\frac{\sqrt{3}}{2}\right) - \left(\frac{\sqrt{2}}{2}\right)\left(\frac{1}{2}\right) \\ &= \frac{\sqrt{6}}{4} - \frac{\sqrt{2}}{4} = \frac{\sqrt{6} - \sqrt{2}}{4} \end{aligned}$$