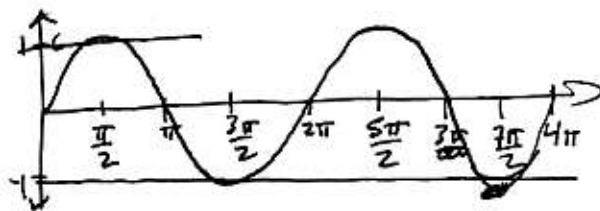


- (35) (a) As  $x \rightarrow \frac{\pi}{2}^-$ ,  $\sec x \rightarrow +\infty$   
 (b) As  $x \rightarrow (\frac{\pi}{2})^+$ ,  $\sec x \rightarrow -\infty$

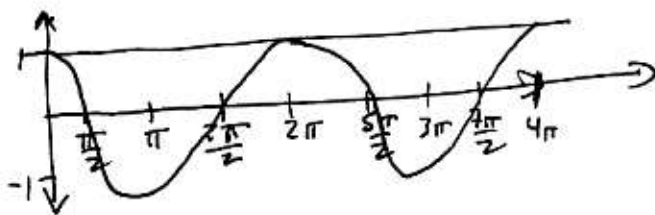
- (37) (a) As  $x \rightarrow 0^-$ ,  $\csc x \rightarrow -\infty$   
 (b) As  $x \rightarrow (\frac{\pi}{2})^+$ ,  $\csc x \rightarrow +\infty$

(39)  $\sin x = -1$

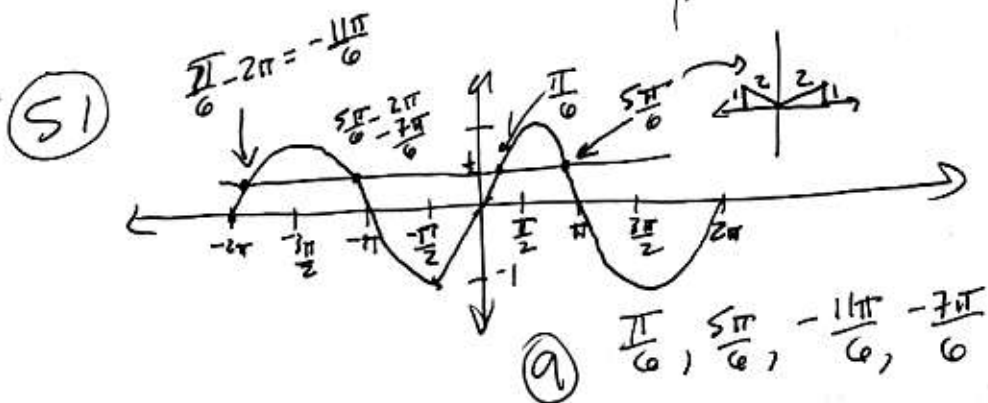
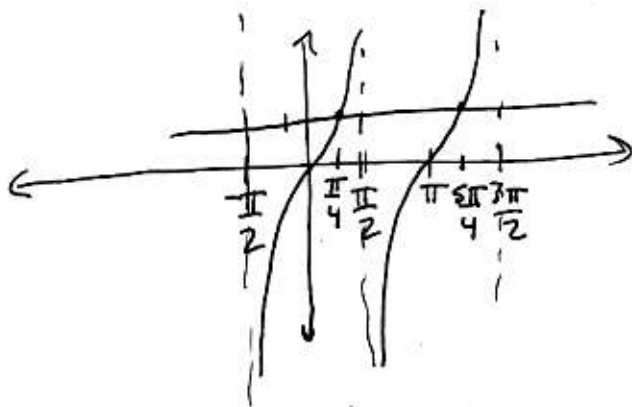
~~$x = \frac{\pi}{2}$  and  $\frac{3\pi}{2}$~~   
 $x = \frac{3\pi}{2}$  and  $\frac{7\pi}{2}$



(43)  $\cos x = 1$   
 $0, 2\pi, 4\pi$



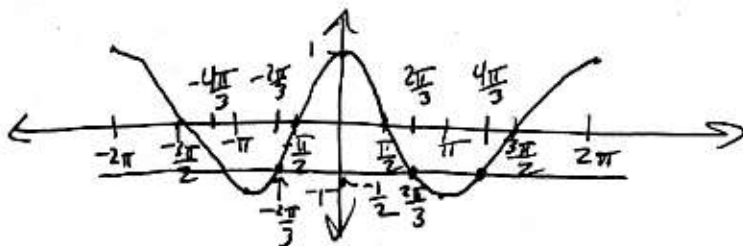
(47)  $\tan x = 1$   
 $\frac{\pi}{4}$  and  $\frac{5\pi}{4}$



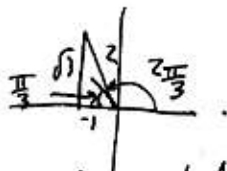
$$\textcircled{b} \sin x > \frac{1}{2} \text{ on } \left(-\frac{11\pi}{6}, -\frac{7\pi}{6}\right) \cup \left(\frac{\pi}{6}, \frac{5\pi}{6}\right)$$

$$\textcircled{c} \sin x < \frac{1}{2} \text{ on } [-2\pi, -\frac{11\pi}{6}) \cup \left(-\frac{7\pi}{6}, \frac{\pi}{6}\right) \cup \left(\frac{5\pi}{6}, 2\pi\right]$$

53



$\cos \theta$  is negative in quadrants ~~I & II~~ II & III.



So  $\cos \frac{2\pi}{3} = -\frac{1}{2}$  whereas  $\cos(-\frac{2\pi}{3}) = -\frac{1}{2}$ .

Also  $-\frac{2\pi}{3} + 2\pi = \frac{4\pi}{3}$ , so  $\cos(\frac{4\pi}{3}) = -\frac{1}{2}$

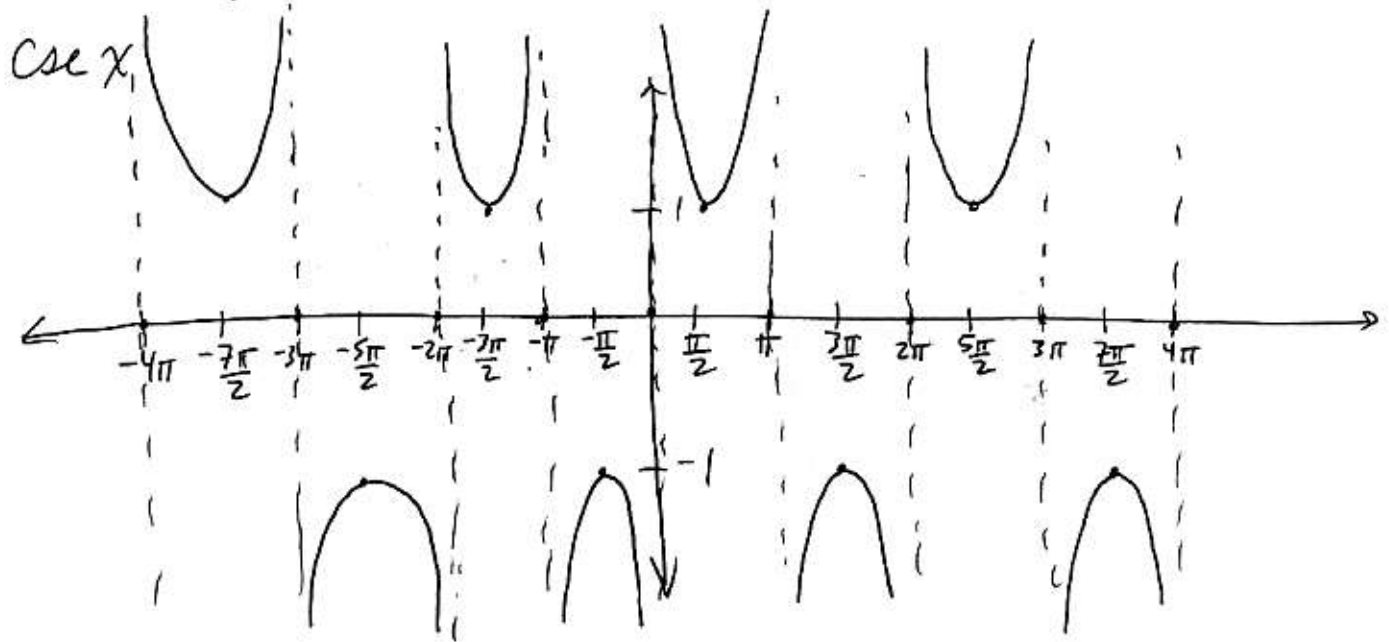
And  $\frac{2\pi}{3} - 2\pi = -\frac{4\pi}{3}$ , so  $\cos(-\frac{4\pi}{3}) = -\frac{1}{2}$

① So  $\cos x = -\frac{1}{2}$  at  $-\frac{4\pi}{3}, -\frac{2\pi}{3}, \frac{2\pi}{3}$  &  $\frac{4\pi}{3}$ .

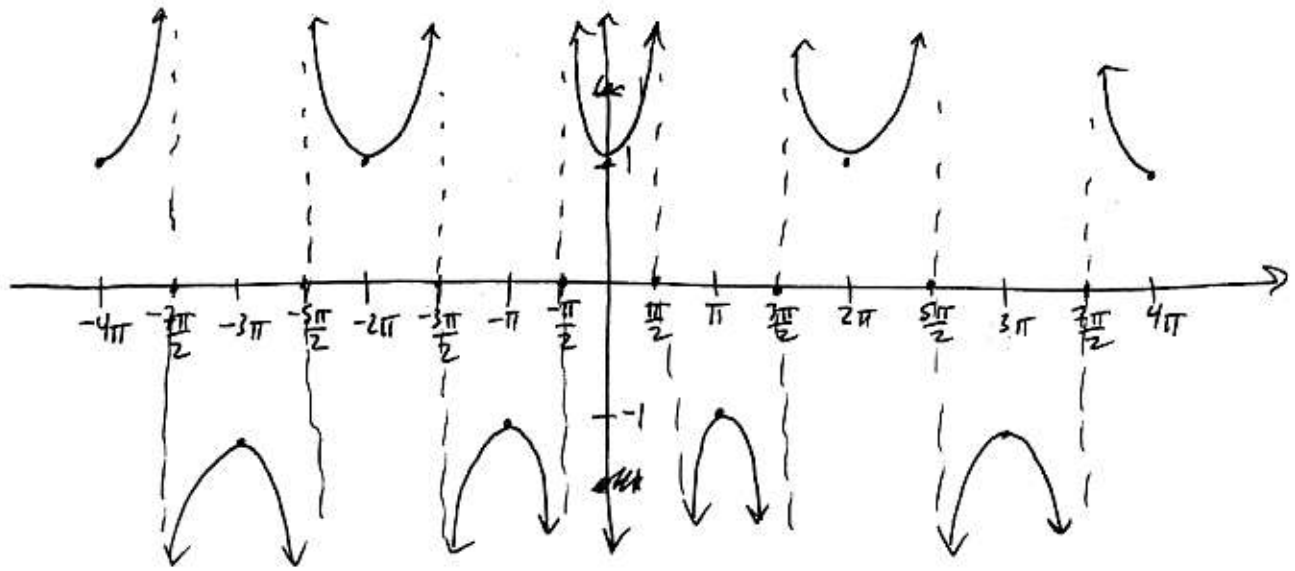
②  $\cos x > -\frac{1}{2}$  on  $[-2\pi, -\frac{4\pi}{3}) \cup (-\frac{2\pi}{3}, \frac{2\pi}{3}) \cup (\frac{4\pi}{3}, 2\pi]$

③  $\cos x < -\frac{1}{2}$  on  $(-\frac{4\pi}{3}, -\frac{2\pi}{3}) \cup (\frac{2\pi}{3}, \frac{4\pi}{3})$ .

# Graphs



$\sec x$



$\cot x$

