King Fahd University of Petroleum & Minerals

College of Sciences, Prep-Year Math program

Id # : *Name:* *Math 002 Quiz#5* *Sec.#:*

1] If $f(x)=2\sec\left(2x+\frac{\pi}{3}\right)-1$

a) Find the amplitude of f if any.

No amplitude

b) Find the period of f

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

c) Find the phase shift of f

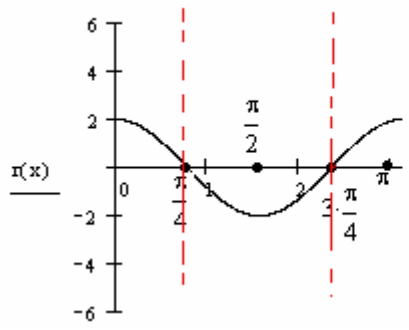
$$-\frac{c}{b}=-\frac{\frac{\pi}{3}}{2}=-\frac{\pi}{6}\ to\ the\ left.$$

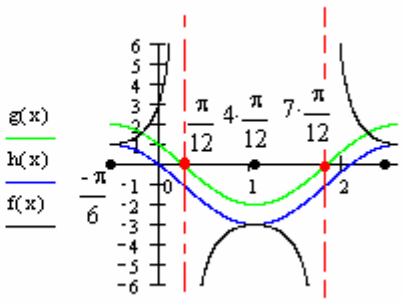
d) Find the equation of vertical asymptote

$$x=\frac{\pi}{12}+\frac{n}{2}(\pi)=\left(\frac{1+6n}{12}\right)\pi, where\ n\ is\ any\ \text{integer}$$

e) Draw the graph of the function f over one period

$$r(x)=2\cos(2x),\quad g(x)=2\cos(2x+\frac{\pi}{3}),\quad h(x)=2\cos(2x+\frac{\pi}{3})-1, f(x)=2\sec(2x+\frac{\pi}{3})-1$$



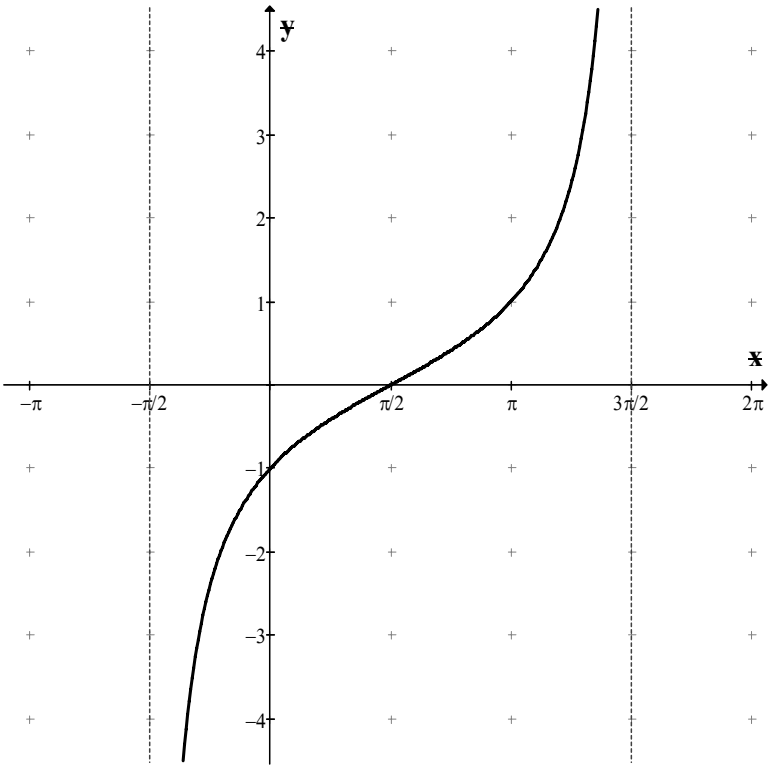


2] Find the period and the amplitude of $f\left(x\right)=-\left|\sin(2x+\frac{\pi}{6})\right|$

The period of $y=\sin(2x+\frac{\pi}{2})$ *is* $\frac{2\pi}{2}=\pi$, *then the period of* $\left|\sin(2x+\frac{\pi}{2})\right|$ *is* $\frac{\pi}{2}$

The amplitude of $y=\sin(2x+\frac{\pi}{2})$ *is* 1, *then the amplitude of* $\left|\sin(2x+\frac{\pi}{2})\right|$ *is* $\frac{1}{2}$

5] Find an equation of the form $f\left(x\right)=a\tan\left(bx+c\right)$ of the given graph



The period of $f\left(x\right)$ *is* $P=\frac{3\pi}{2}-\left(-\frac{\pi}{2}\right)=2\pi=\frac{\pi}{b}\rightarrow b=\frac{1}{2}$

The phase shift is $-\frac{c}{b}=-\frac{c}{1/2}=\frac{\pi}{2}\rightarrow c=-\frac{\pi}{4}$

Then $f\left(x\right)=a\tan\left(\frac{x}{2}-\frac{\pi}{4}\right)$

From the graph $f\left(\pi\right)=1\rightarrow 1=a\tan\left(\frac{\pi}{2}-\frac{\pi}{4}\right)=a\tan\left(\frac{\pi}{4}\right)$

Then $1=a\left(1\right)\rightarrow a=1$, *then* $f\left(x\right)=\tan\left(\frac{x}{2}-\frac{\pi}{4}\right)$