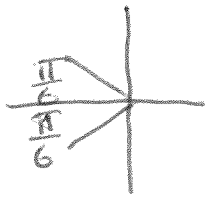
Name Mike Date _____

Math 112: #19 A/B/C/D

A) Find ***all*** the solutions to the equation $\sqrt{3}\sec 3t = -2$.

$\sec 3t = \frac{-2}{\sqrt{3}} = \frac{-2\sqrt{3}}{3}$ (1/cos)

or $\cos 3t = -\frac{\sqrt{3}}{2}$



$\frac{1}{3}\cdot 3t = \frac{1}{3}\cdot\frac{5\pi}{6} + 2\pi n\cdot\frac{1}{3}$

$\frac{1}{3}\cdot 3t = \frac{1}{3}\cdot\frac{7\pi}{6} + 2\pi n\cdot\frac{1}{3}$

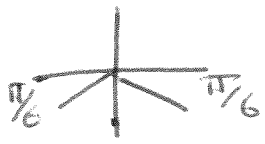
$t = \frac{5\pi}{18} + \frac{2\pi n}{3}$ $n \in \mathbb{Z}$

and

$t = \frac{7\pi}{18} + \frac{2\pi n}{3}$

B) Find ***all*** the solutions to the equation $2\sin 3\theta + 1 = 0$

$\sin 3\theta = -\frac{1}{2}$



$\frac{1}{3}\cdot 3\theta = \frac{1}{3}\cdot\frac{7\pi}{6} + 2\pi n\cdot\frac{1}{3}$

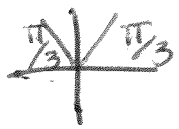
$\frac{1}{3}\cdot 3\theta = \frac{1}{3}\cdot\frac{11\pi}{6} + 2\pi n\cdot\frac{1}{3}$

$\theta = \frac{7\pi}{18} + \frac{2\pi n}{3}$ $n \in \mathbb{Z}$

$\theta = \frac{11\pi}{18} + \frac{2\pi n}{3}$

C) Find ***all*** the solutions to the equation $2\sin 4t - \sqrt{3} = 0$

$\sin 4t = \frac{\sqrt{3}}{2}$



$\frac{1}{4}\cdot 4t = \frac{1}{4}\frac{\pi}{3} + 2\pi n \cdot \frac{1}{4} = \frac{2\pi n}{4} = \frac{\pi n}{2}$

and

$\frac{1}{4}\cdot 4t = \frac{1}{4}\frac{2\pi}{3} + 2\pi n \cdot \frac{1}{4}$

$t = \frac{\pi}{12} + \frac{\pi n}{2}$

and

$t = \frac{2\pi}{12} + \frac{\pi n}{2} \quad n \in \mathbb{Z}$

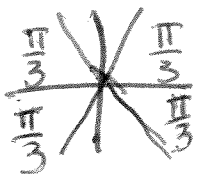
$= \frac{\pi}{6} + \frac{\pi n}{2}$

D) Find ***all*** the solutions to the equation $3\csc^2 2t = 4$.

$\csc^2 2t = \frac{4}{3}$

or $\sin 2t = \pm\frac{\sqrt{3}}{2}$

$\underset{1/\sin}{\csc} 2t = \pm\frac{2}{\sqrt{3}} = \frac{2\sqrt{3}}{3}$



$\frac{1}{2}\cdot 2t = \frac{1}{2}\frac{\pi}{3} + \pi n \cdot \frac{1}{2}$

and

$\frac{1}{2}\cdot 2t = \frac{1}{2}\frac{2\pi}{3} + \pi n \cdot \frac{1}{2}$

$t = \frac{\pi}{6} + \frac{\pi n}{2}$

and

$t = \frac{\pi}{3} + \frac{\pi n}{2} \quad n \in \mathbb{Z}$