Precalculus Name _____ ID: 1

Practice Quiz (No calculator for these questions)

Find the amplitude, the period in radians, the phase shift in radians, the vertical shift, the minimum and maximum values, and two vertical asymptotes (if any). Graph at least one cycle.

1) $y = 9\sec\left(3\theta + \frac{\pi}{4}\right) - 1$ $9\sec\left(3\left(\theta + \frac{\pi}{12}\right)\right) - 1$

2) $y = -2\csc\left(\frac{\theta}{6} - \frac{\pi}{3}\right) + 3$ $-2\csc\left(\frac{1}{6}(\theta - 2\pi)\right) + 3$

Amp = 9

Per = $\frac{2\pi}{3}$

midline $y = -1$

Phase Shift Right $\frac{\pi}{12}$

each Tick $\frac{2\pi}{3} \cdot \frac{1}{4} = \frac{2\pi}{12}$

For This one, I'd make each Tick $\frac{\pi}{12}$

Cos

VA $\frac{\pi}{4}$ VA $\frac{7\pi}{12}$

Amp = 2

Per = $\frac{2\pi}{\frac{1}{6}} \rightarrow 12\pi$

Right 2π

reflected around $y = 3$

midline $y = 3$

each Tick = π

over $\frac{12\pi}{4} \rightarrow 3\pi$ is a Turning pt

2π 4π 6π 8π 10π 12π

$x = 11\pi$

If you take This Quiz, Quiz needs to be completed by 2:30 on Friday

-10

Find the exact value of each expression.

3) $\tan^{-1}\left(\sin -\frac{\pi}{2}\right)$

$\sin\left(-\frac{\pi}{2}\right) = -1$

$\arctan(-1)$

$\boxed{-\frac{\pi}{4}}$

4) $\cos^{-1}\left(\sin -\frac{\pi}{4}\right)$

$\sin\left(-\frac{\pi}{4}\right) = -\frac{\sqrt{2}}{2}$

$\arccos\left(-\frac{\sqrt{2}}{2}\right) = \boxed{\frac{3\pi}{4}}$

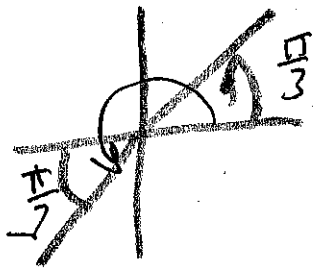
Calculator active

Solve each equation for $0 \le \theta < 2\pi$. Exact values. You'll want a Unit Circle or the table on the wall (You have a copy)

5) $4\tan\theta = 4\sqrt{3}$

$\tan\theta = \sqrt{3}$

$\arctan\sqrt{3}$



$\frac{\pi}{3}$ and $\frac{4\pi}{3}$

6) $\sin 2\theta = \frac{\sqrt{2}}{2}$

$\sin u = \frac{\sqrt{2}}{2}$

$2\theta = \frac{\pi}{4} + 2\pi k$

$\theta = \frac{\pi}{8} + \pi k$

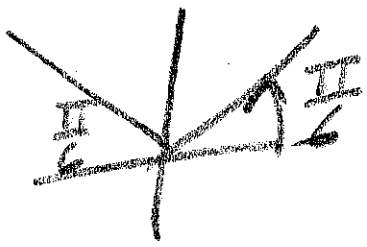
$2\theta = \frac{3\pi}{4} + 2\pi k$

$\theta = \frac{3\pi}{8} + \pi k$ $\quad \frac{8\pi}{8}$

$\frac{\pi}{8}, \frac{3\pi}{8}, \frac{9\pi}{8}, \frac{11\pi}{8}$

7) $\sin \frac{\theta}{4} = \frac{1}{2}$

$\sin u = \frac{1}{2}$



$\frac{1}{4}\theta = \frac{\pi}{6} + 2\pi k$ $\quad \frac{1}{4}\theta = \frac{5\pi}{6} + 2\pi k$

$\theta = \frac{2\pi}{3} + 8\pi k$ $\quad \theta = \frac{10\pi}{6} + 8\pi k$

$\frac{24\pi}{3}$

only 2 answers

8) $\cos\theta - 2\cos^2\theta = -4\cos^2\theta$

$\cos\theta + 2\cos^2\theta = 0$

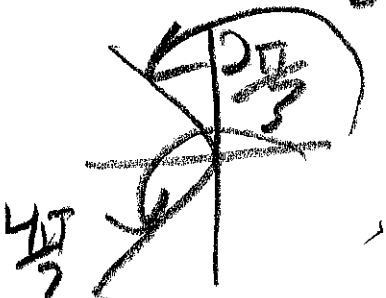
$\cos\theta(1 + 2\cos\theta) = 0$

$\cos\theta = 0$ $\quad 1 + 2\cos\theta = 0$

$\cos\theta = -\frac{1}{2}$

$\frac{\pi}{2}$

$\frac{3\pi}{2}$



$\frac{\pi}{2}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{3\pi}{2}$

9) $-\sqrt{3}\tan^2\theta + 3\tan^2\theta = 3\tan\theta + 3\tan^2\theta$

$-\sqrt{3}\tan^2\theta - 3\tan\theta = 0$

$\tan\theta(-\sqrt{3}\tan\theta - 3) = 0$

$\tan\theta = 0$ $\quad -\sqrt{3}\tan\theta - 3 = 0$

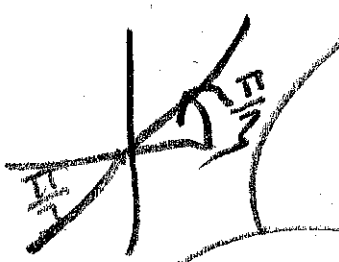
$0, \pi$

$\tan\theta = \frac{3}{\sqrt{3}}$

or

$\tan\theta = \sqrt{3}$

$\frac{3}{\sqrt{3}} \cdot \frac{\sqrt{3}}{\sqrt{3}} = \frac{3\sqrt{3}}{3}$



$\frac{\pi}{3}, \frac{4\pi}{3}$

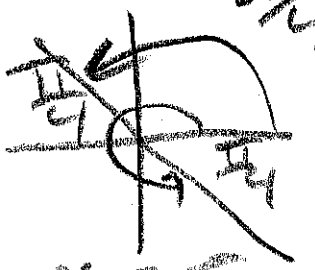
10) $1 + 3\tan^2\theta = -2\tan\theta + 2\tan^2\theta$

$\tan^2\theta + 2\tan\theta + 1 = 0$

$(\tan\theta + 1)(\tan\theta + 1) = 0$

$\tan\theta = -1$

$3\pi/4$



$\frac{8\pi}{4} - \frac{\pi}{4}$ $\frac{7\pi}{4}$

$\frac{3\pi}{4}, \frac{7\pi}{4}$

11) $-2\sin^2\theta = 2\sin\theta + 1 - \sin^2\theta$

$0 = \sin^2\theta + 2\sin\theta + 1$

$(\sin\theta + 1)^2 = 0$

$\sin\theta + 1 = 0$

$\sin\theta = -1$

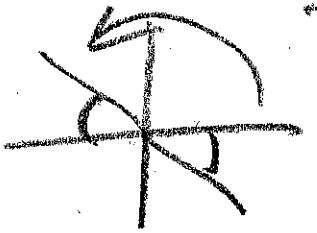
$\frac{3\pi}{2}$

Find all solutions to each equation in radians.

12) $2\tan 3\theta = -2$

$\tan 3\theta = -1$

3π



$3\theta = \frac{3\pi}{4} + \pi k$

$\theta = \frac{\pi}{4} + \frac{\pi}{3}k$

$3\theta = \frac{7\pi}{4} + \pi k$

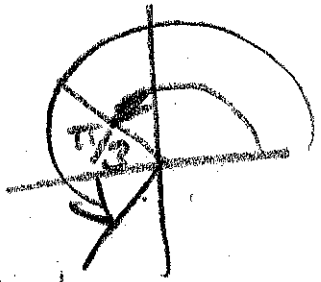
$\theta = \frac{7\pi}{12} + \frac{\pi}{3}k$

13) $-5 + \cos\frac{\theta}{4} = -\frac{11}{2} + \frac{10}{2}$

$+\frac{11}{2}$

$\cos\left(\frac{1}{4}\theta\right) = -\frac{1}{2}$

$\cos u = -\frac{1}{2}$



$\frac{1}{4}\theta = \frac{2\pi}{3} + 2\pi k$

$\theta = \frac{8\pi}{3} + 8\pi k$

$\frac{1}{4}\theta = \frac{4\pi}{3} + 2\pi k$

$\theta = \frac{16\pi}{3} + 8\pi k$