Pre-Calculus #1C Solving Trig Equations

Name Key

Solve EACH equation for **ALL** values of x in radians.

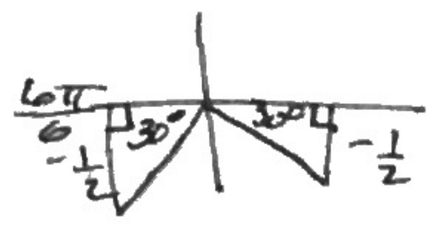
1. $5\sin x + 2 = \sin x$

$-\sin x \quad -\sin x$

$4\sin x + 2 = 0$

$4\sin x = -2$

$\sin x = -\frac{1}{2}$



$x = \frac{7\pi}{6} + 2\pi N$

OR

$\frac{11\pi}{6} + 2\pi N$

2. $2 = 4\cos^2 x + 1$

→ you

$[0, 2\pi)$

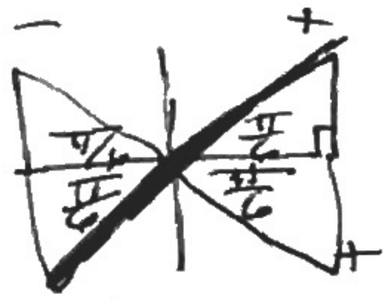
$x = \frac{\pi}{3}, \frac{2\pi}{3}, \frac{4\pi}{3}, \frac{5\pi}{3}$

you need to do ALL

3. $9 + \cos^2 x = 12$

$\sqrt{\cot^2 x} = \sqrt{\frac{4}{3}}$

$\cot x = \pm \frac{2}{\sqrt{3}}$



$x = \frac{\pi}{6} + 2\pi N$,

~~$\frac{5\pi}{6} + 2\pi N$~~

$\frac{7\pi}{6} + 2\pi N$

$\frac{11\pi}{6} + 2\pi N$

OR

$x = \frac{\pi}{6} + \pi N$

OR $\frac{7\pi}{6} + \pi N$

why?

4. $\sin^4 x + 2\sin^2 x - 3 = 0$

$[0, 2\pi)$

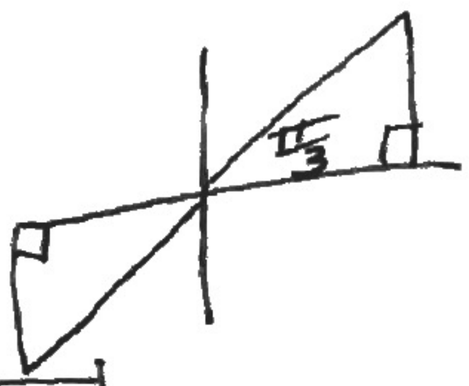
$x = \frac{\pi}{2}, \frac{3\pi}{2}$

5. $7\cot x - \sqrt{3} = 4\cot x$

$3\cot x = \sqrt{3}$

$\cot x = \frac{\sqrt{3}}{3}$

$\tan x = \sqrt{3}$



$x = \frac{\pi}{3} + \pi N$

6. $4\cot x = \cot x \sin^2 x$

$[0, 2\pi)$

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

Find all solutions of each equation on $[0, 2\pi]$.

7. $3\csc x = 2\csc x + \sqrt{2}$

$\csc x = \sqrt{2}$

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

$x = \frac{\pi}{4}$ OR $\frac{3\pi}{4}$

8. $6\tan\frac{1}{2}x - 2 = 4$

$x = \frac{\pi}{4}$, —, —, —

9. $\cos^3 x + \cos^2 x - \cos x = 1$ Factor by Grouping

$(\cos^3 x + \cos^2 x) + (-\cos x - 1) = 0$

$\cos^2 x(\cos x + 1) - 1(\cos x + 1) = 0$

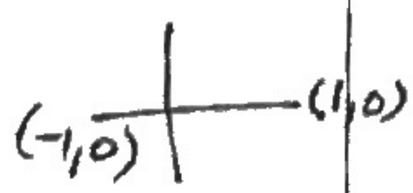
$(\cos x + 1)(\cos^2 x - 1) = 0$

$\cos x = -1$ $\quad \cos^2 x = 1$

$x = \pi$ $\quad \cos x = \pm 1$

$x = 0, \pi, 2\pi$

$x = 0, \pi, 2\pi$



10. $1 = \cot^2 x + \csc x$

$x = \frac{7\pi}{6}$, —, —

Pre-Calculus #2C Sum and Difference Identities Name_____

Determine the 2 angles used to write the original trig expression, WRITE using the sum/difference identities. DO NOT SOLVE!

1. $\cos 75° =$

$\cos(45° + 30°) = \cos 45° \cos 30° - \sin 45° \sin 30°$

2. $\sin 15° =$

$\sin(\_\_\_ - \_\_\_) = \_\_\_\_\_$

3. $\sin 105° =$

$\sin(150° - 45°) = \sin 150° \cos 45° - \cos 150° \sin 45°$

4. $\tan 165° =$

$\tan(\_\_\_ + \_\_\_) = \_\_\_\_\_$