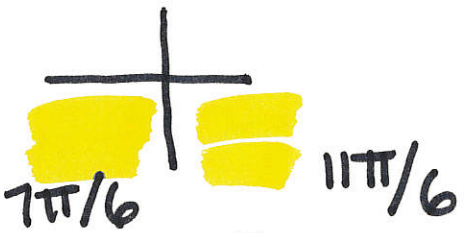


Unit 7 (Section 5.5) Solving Trig Equations Practice A

Directions: Solve for x algebraically, given the domain. Show all work.

1) $4\sin x + 2 = 0, 0 \leq x < 2\pi$

$4\sin x = -2$
 $\sin x = -\frac{1}{2}$



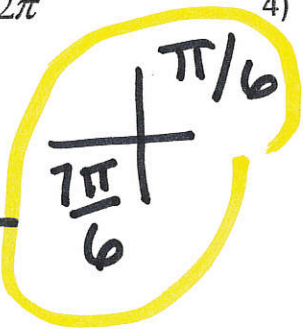
2) $4\sec x + 8 = 0, 0 \leq x < 2\pi$

$\sec x = -2$
 $\frac{1}{\cos x} = -\frac{2}{1}$
 $\cos x = -\frac{1}{2}$



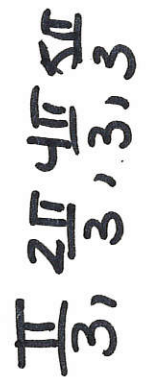
3) $\cot x - \sqrt{3} = 0, 0 \leq x < 2\pi$

$\cot x = \sqrt{3}$
 $\tan x = \frac{1}{\sqrt{3}}$
 $\tan x = \frac{\sqrt{3}}{3}$
 $\frac{\pi}{6}$ fam



4) $3\cot^2 x - 1 = 0, 0 \leq x < 2\pi$

$\cot^2 x = \frac{1}{3}$
 $\cot x = \pm \sqrt{\frac{1}{3}}$
 $\cot x = \pm \frac{1}{\sqrt{3}}$
 $\frac{1}{\tan x} = \pm \frac{1}{\sqrt{3}}$
 $\tan x = \pm \sqrt{3}$



5) $2\sin^2 x + 5\sin x - 3 = 0, 0 \leq x < 2\pi$

$2\sin^2 x + 5\sin x - 3 = 0$
 $(2\sin x - 1)(\sin x + 3) = 0$
 $\sin x = \frac{1}{2}$ $\sin x = -3$
 $\frac{5\pi}{6}$ $\frac{\pi}{6}$ ∴

6) $2\tan^2 x - \tan x - 6 = 0, 0 \leq x < 2\pi$

~~$(2\tan x + 3)(\tan x - 2) = 0$~~
 ~~$\tan x = -\frac{3}{2}$ $\tan x = 2$~~
 ~~$\frac{7\pi}{6}, \frac{5\pi}{6}$ $\frac{\pi}{4}, \frac{3\pi}{4}$~~
 Calc

7) $\sec x \sin x - 3 \sin x = 0, 0 \leq x < 2\pi$

$\sin x (\sec x - 3) = 0$

$\sin x = 0 \quad \sec x = 3$

$0, \pi, \quad \cos x = \frac{1}{3}$

9) $\cos 2x = -\frac{1}{\sqrt{2}}, 0 \leq x < 2\pi$
 \downarrow Calc.

a) if the domain is $0 \leq x < 2\pi$

$\cos k = -\frac{\sqrt{2}}{2}$

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

$k = \frac{5\pi}{4}$

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

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

$x = \frac{3\pi}{8}$

$x = \frac{5\pi}{8}$

10) $\cos^2 x - \cos x - 2 = 0$

a) if the domain is $-\pi \leq x < \pi$

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

$\cos x = -1$

π

given the domain $-\pi \leq x < \pi$

answer : $-\pi$

8) $\cos 3x = 0, 0 \leq x < 2\pi$

let $u = 3x$

$\cos u = 0$

$u = \frac{\pi}{2}$

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

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

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

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

$x = \frac{3\pi}{6}$

Any other possibilities?
 b) if the domain is $-\pi \leq x < \pi$

$u = \frac{\pi}{2} + 2\pi k$

$x = \frac{\pi}{2} + \pi k$

$3x = \frac{\pi}{2} + 2\pi k$

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

$x = \frac{\pi}{6} + \frac{2\pi k}{3}$

$\frac{\pi}{6}, \frac{\pi}{6} + \frac{4\pi}{6} = \frac{5\pi}{6}$

Are these the only values of x between 0 and 2π that give us the desired outcome?

$x = \frac{5\pi}{8} + \pi = \frac{13\pi}{8}$

$2x = \frac{3\pi}{4} \quad x = \frac{3\pi}{8}$

b) if the domain is $-\frac{\pi}{2} < x < \frac{\pi}{2}$

$\frac{11\pi}{8}$

\emptyset

check answers!

They work