PC

Ch 5.3 ex 1

solving for x with trig

* remember the period of $\cos x$, $\sin x$, $\csc x$ & $\sec x$ is 2π
* the period for $\tan x$ & $\cot x$ is π

$\boxed{\text{step 1}}$ solve for the trig function on it's own

example: $2\tan x - \sqrt{3} = \cancel{\tan x}$
$-\tan x \qquad -\cancel{\tan x}$
$\tan x - \sqrt{3} = 0$
$+\sqrt{3} \quad +\sqrt{3}$
$\tan x = \sqrt{3}$

$\boxed{\text{step2}}$ think the unit circle, where does $\tan x = \sqrt{3}$? $x = \pi/3$ & $4\pi/3$

$\boxed{\text{step3}}$ you found the answers for $[0, 2\pi]$ now for $(-\infty, \infty)$ you include the period.

$x = \pi/3 + \underbrace{\pi n}_{}$

every π you are back to $\tan x = \sqrt{3}$

* only need $\pi/3$ because it's tangent

example

3. $2 = 4\cos^2 x + 1$
$-1 \qquad\qquad -1$
$1 = 4\cos^2 x$ step 1
$\frac{1}{4} = \cos^2 x$
$\pm\frac{1}{2} = \cos x$

$x = \pi/3, 2\pi/3, 4\pi/3, 5\pi/3$ step2 $[0, 2\pi]$

$\underbrace{x = \pi/3 + 2\pi n,\ 2\pi/3 + 2\pi n,\ 4\pi/3 + 2\pi n,\ 5\pi/3 + 2\pi n}_{\text{final answer}}$ step3, use $2\pi n$ because $\cos x$ period is 2π