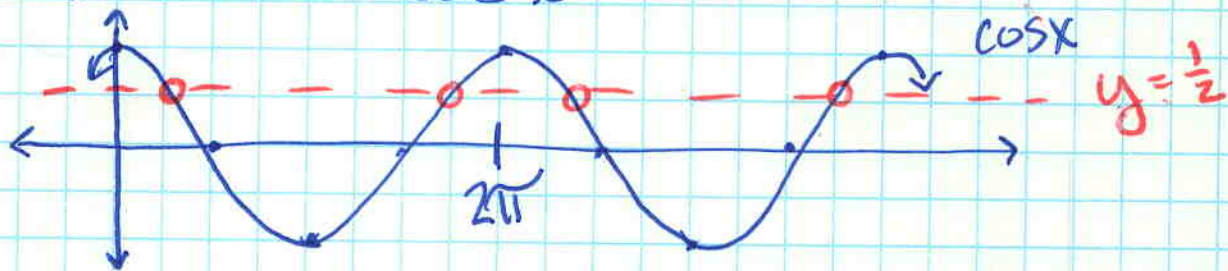


5-3-1 Solving Trig Equations

verify \rightarrow prove for every x

solving \rightarrow find certain x 's that make the equation true.

Consider $\cos x = \frac{1}{2}$



1. find solutions on one period

2. Add $2\pi n$ to every solution

* period:

$$\cos, \sin \quad \frac{2\pi}{b}$$

$$\tan \quad \frac{\pi}{b}$$

on $[0, 2\pi)$ $x = \frac{\pi}{3}, \frac{5\pi}{3}$

on $(-\infty, \infty)$, $x = \frac{\pi}{3} + 2\pi n$

and $x = \frac{5\pi}{3} + 2\pi n$

$$\text{Ex } \frac{4\sin x - 2\sin x + \sqrt{2}}{-2\sin x - 2\sin x}$$

$$\begin{aligned} 2\sin x &= \sqrt{2} \\ \sin x &= \frac{\sqrt{2}}{2} \end{aligned}$$

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

on $(-\infty, \infty)$

$$x = \frac{\pi}{4} + 2\pi n$$

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

331: 1, 4, 6, 7, 11, 17

Ex 1 - Isolate Trig Expressions
get trig stuff on one side of =

$$\text{Solve } 2\tan x - \sqrt{3} = \tan x$$

$$2\tan x - \tan x = \sqrt{3} \quad \begin{array}{l} +\sqrt{3} \\ -\tan x \end{array} \quad \text{subtract}$$

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

$$\text{period} = \pi$$

Solutions from $[0, \pi)$ are $x = \frac{\pi}{3}, \frac{2\pi}{3}$

Solutions from $(-\infty, \infty)$ are $x = \frac{\pi}{3} + \pi n$