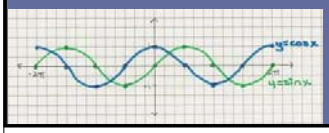
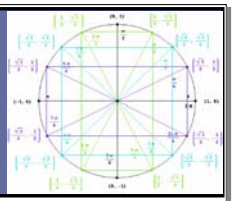


Unit 4: Trigonometry



4.8 Solving Trig Equations with General Solutions

When giving a general solution for a trig equations, it means that there are infinite solutions as you can rotate around an infinite angle.

Ex.) For the following trig equations, give (a) the solution for $[0^o, 360^o)$ and (b) the general solution.

a) $2\cos\theta = \sqrt{2}$

$\cos\theta = \frac{\sqrt{2}}{2}$

a) $\theta = 45°, 315°$

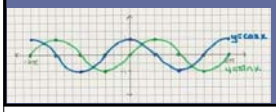
S | A
T | C

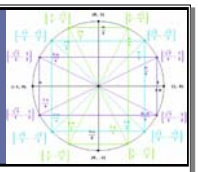
b) General Solution

$45° + 360°n$
$315° + 360°n$ $\Big\}\ n \in I$

↑ Period

$45° \pm 360°n, n \in W$





b) $2\cos^2 x - 1 = 0$

$2\cos^2 x = 1$

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

$\cos x = \pm\sqrt{\frac{1}{2}} = \frac{1}{\sqrt{2}} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \pm\frac{\sqrt{2}}{2}$

$x = 45°, 135°, 225°, 315°.$

a) $x = \frac{\pi}{4}, \frac{3\pi}{4}, \frac{5\pi}{4}, \frac{7\pi}{4}.$

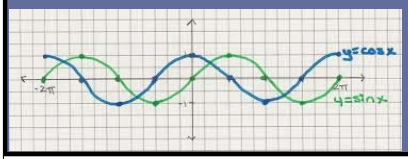
b) $\frac{\pi}{4} + 2\pi n, n \in I$

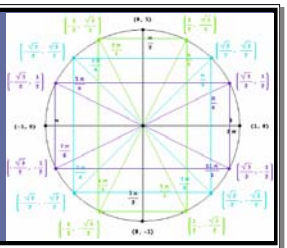
$\frac{3\pi}{4} + 2\pi n, n \in I$

$\frac{5\pi}{4} + 2\pi n, n \in I$

$\frac{7\pi}{4} + 2\pi n, n \in I$

OR $\frac{\pi}{4} + \frac{\pi}{2}n, n \in I$





c) $16 = 6\cos[(\pi/6)x] + 14$

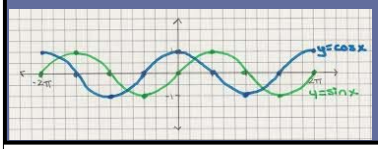
$y_1 \quad y_2$

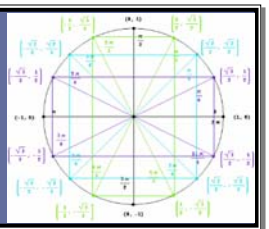
$X = 2.35$

$X = 9.65$

Numerical Response: Solve to the nearest hundredth. $[0, 12)$

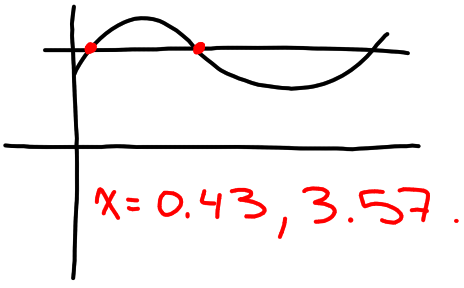
$P = \frac{2\pi}{\frac{\pi}{6}} = 2\pi \cdot \frac{6}{\pi} = 12$





d) $10 = 6\sin[(\pi/4)x] + 8$

$0 \le x < 2\pi$



$X = 0.43, 3.57$.

Pg. 275 # 1, 4, 5, 6, 10.