

Solving sin and cos Equations.

Ex: $2\sin\frac{\pi}{2}(x-1) - 1 = 0$

Steps:

- Establish period = $\frac{2\pi}{|\frac{\pi}{2}|}$
- Solve the equation by isolating the Variable
 - isolate
 - sin/cos(k(x-h))
 - Find the angles b(x-h) over the interval $[0, 2\pi]$
 - isolate x
 - Determine all solution using the period.

$2\sin\frac{\pi}{2}(x-1) - 1 = 0$

$2\sin\frac{\pi}{2}(x-1) = 1$

$\sin\frac{\pi}{2}(x-1) = \frac{1}{2}$

From Trig \circ (Remove sin)

| | |
|--------------------------------------|---------------------------------------|
| $\frac{\pi}{2}(x-1) = \frac{\pi}{6}$ | $\frac{\pi}{2}(x-1) = \frac{5\pi}{6}$ |
| $\frac{1}{2}(x-1) = \frac{1}{6}$ | $\frac{1}{2}(x-1) = \frac{5}{6}$ |
| $x-1 = \frac{2}{6}$ | $x-1 = \frac{10}{6}$ |
| $x-1 = \frac{1}{3}$ | $x = \frac{10}{6} + 1 = \frac{8}{3}$ |
| $x = \frac{1}{3} + 1 = \frac{4}{3}$ | |

Solution $\left[\frac{4}{3} + 4n\right] \cup \left[\frac{8}{3} + 4n\right]$
 $n \in \mathbb{Z}$

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Ex 2:-

Solve:

$2\cos\frac{\pi}{2}(x-1) - 1 = 0$

$\cos\frac{\pi}{2}(x-1) = \frac{1}{2}$

$\frac{\pi}{2}(x-1) = \frac{\pi}{3}$ $\frac{\pi}{2}(x-1) = \frac{5\pi}{3}$

$\frac{1}{2}(x-1) = \frac{1}{3}$ $\frac{1}{2}(x-1) = \frac{5}{3}$

$x-1 = \frac{2}{3}$ $x-1 = \frac{10}{3}$

$x = \frac{2}{3} + 1$ $x = \frac{10}{3} + 1$

$= \frac{5}{3}$ $x = \frac{13}{3}$

Solution: $\left[\frac{5}{3} + 4n\right] \cup \left[\frac{13}{3} + 4n\right]$
 $n \in \mathbb{Z}$

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All Parts All Parts.

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