

7.2c Trig Equations with Different Periods

Note Title

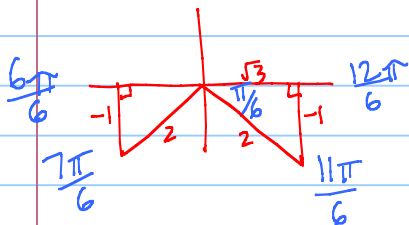
05/12/2012

Solve $2\sin(2x) + 1 = 0$

Let $\theta = 2x$

$2\sin\theta + 1 = 0$

$\sin\theta = -\frac{1}{2}$



$\theta = \frac{7\pi}{6} + 2\pi n, \frac{11\pi}{6} + 2\pi n, n \in \mathbb{Z}$

$2x = \frac{7\pi}{6} + 2\pi n, \frac{11\pi}{6} + 2\pi n$

$x = \frac{7\pi}{12} + \pi n, \frac{11\pi}{12} + \pi n$

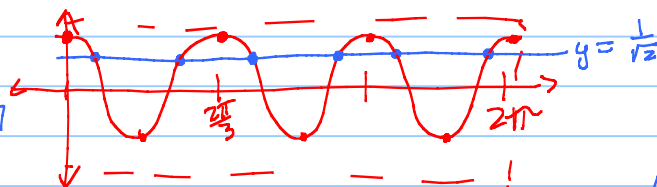
Period of $\sin 2x$

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

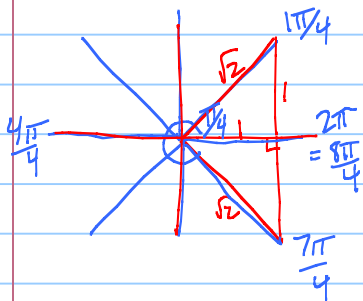
Solve $2\cos 3x - \sqrt{2} = 0$ for $0 \leq x < 2\pi$.

$\frac{2}{2}\cos 3x = \frac{\sqrt{2}}{2}$

$\cos 3x = \frac{1}{\sqrt{2}} \approx 0.7$



This has 6 solutions!

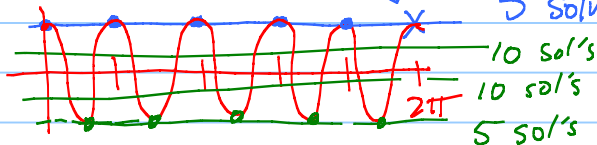


$3x = \frac{\pi}{4}, \frac{7\pi}{4}, \frac{9\pi}{4}, \frac{15\pi}{4}, \frac{17\pi}{4}, \frac{23\pi}{4}$

$x = \frac{\pi}{12}, \frac{7\pi}{12}, \frac{9\pi}{12}, \frac{15\pi}{12}, \frac{17\pi}{12}, \frac{23\pi}{12}$

How many solutions does $3\cos 5x - 3 = 0$ have for $0 \leq x < 2\pi$?

$\cos 5x = 1$



- a) 0 b) 5 c) 10 d) ~~15~~ e) ~~20~~
- > 1 or $< -1 \Rightarrow$ no solutions $-1 \leq \cos 5x \leq 1$

