

November 4

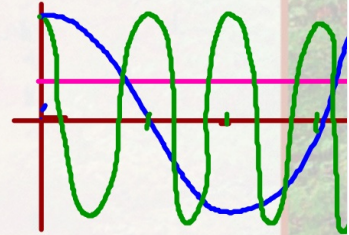
On the interval from 0 to 2π ,
why does the equation

$$2\cos(4x) = 1$$

have more solutions than

$$2\cos(x) = 1?$$

How many more?



November 4

Students will verbally explain how to
solve trig equations

(using the words:
inverse, angle ...)



Find all solutions on the interval $[0, 2\pi)$

$$0 \leq x < 2\pi$$

$$\tan(x)(\tan x - 1) = 0$$

$$\tan(x)(\tan(x) - 1) = 0$$

$$\tan(x) = 0$$

$$\tan^{-1}(\tan x) = \tan^{-1}(0)$$

$$x = \tan^{-1}(0)$$

$$x = 0, \pi, 2\pi$$

$$\tan(x) - 1 = 0$$

$$\begin{array}{r} +1 \quad +1 \\ \hline \end{array}$$

$$\tan(x) = 1$$

$$\tan^{-1}(\tan x) = \tan^{-1}(1)$$

$$x = \tan^{-1}(1)$$

$$x = \frac{\pi}{4}, \frac{5\pi}{4}$$

Find all solutions on the interval $[0, 2\pi)$

$$\cos^3(x) = \cos(x)$$

$$\cos^3(x) = \cos(x)$$

$$(\cos(x))^3 = \cos(x)$$

$$\begin{array}{r} -\cos(x) \quad -\cos(x) \\ \hline \end{array}$$

$$(\cos(x))^3 - \cos(x) = 0$$

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

$$\cos x = 0$$

$$\cos^{-1}(\cos x) = \cos^{-1}(0)$$

$$x = \cos^{-1}(0)$$

$$x = \frac{\pi}{2}, \frac{3\pi}{2}$$

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

$$\begin{array}{r} +1 \quad +1 \\ \hline \sqrt{(\cos x)^2} = 1 \end{array}$$

$$\cos x = 1$$

$$\cos^{-1}(\cos x) = \cos^{-1}(1)$$

$$x = \cos^{-1}(1)$$

$$x = 0, \pi, 2\pi$$

$$\cos x = -1$$

$$\cos^{-1}(\cos x) = \cos^{-1}(-1)$$

$$x = \cos^{-1}(-1)$$

$$\begin{array}{l} y^3 - y = 0 \\ y(y^2 - 1) = 0 \end{array}$$

Find all solutions on
the interval $[0, 2\pi)$

$$2\sin^2 x + 3\sin x + 1 = 0$$

$$2\sin^2 x + 3\sin x + 1 = 0$$

$$2(\sin x)^2 + 3\sin x + 1 = 0$$

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

$$\sin x + 1 = 0$$

$$\sin(x) = -1$$

$$\sin^{-1}(\sin x) = \sin^{-1}(-1)$$

$$x = \sin^{-1}(-1)$$

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

$$2\sin x + 1 = 0$$

$$2\sin x = -1$$

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

$$\sin^{-1}(\sin x) = \sin^{-1}\left(-\frac{1}{2}\right)$$

$$x = \sin^{-1}\left(-\frac{1}{2}\right)$$

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

$$2y^2 + 3y + 1 = 0$$

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

$$2y^2 + 2y + 1y + 1 = 0$$

$$2y(y+1) + 1(y+1) = 0$$

$$(y+1)(2y+1) = 0$$

Pg 237

#6-30 (multiples of 3 - skip #21), 41

Pg 200

#3, 5, 7, 13, 15, 19,

20, 25, 31, 35, 48

pg 190 #4 - 18 (even), 32,

36 - 48 (even)