

Thursday, February 21, 2019
6:40 PM

5.3D

17, 19, 35, 37, 39

Solve the equation.

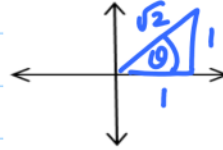
17) $2 \sin^2 2x = 1$

$\sqrt{\sin^2 2x} = \sqrt{\frac{1}{2}}$

$|\sin 2x| = \frac{1}{\sqrt{2}}$

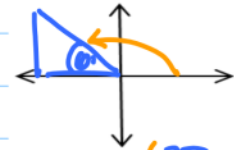
$\sin 2x = \pm \frac{1}{\sqrt{2}}$

period = $\frac{2\pi}{6} = \frac{2\pi}{2} = \pi$



$\frac{1}{2}(2x) = (\frac{\pi}{4} + 2\pi n) \frac{1}{2}$

$x = \frac{\pi}{8} + \pi n$

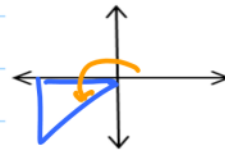


$\frac{1}{2}(2x) = (\frac{3\pi}{4} + 2\pi n) \frac{1}{2}$

$x = \frac{3\pi}{8} + \pi n$

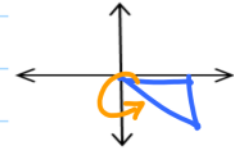
* We can combine these as follows:

$x = \frac{\pi}{8} + \frac{n\pi}{2}, x = \frac{3\pi}{8} + \frac{n\pi}{2}$



$\frac{1}{2}(2x) = (\frac{5\pi}{4} + 2\pi n) \frac{1}{2}$

$x = \frac{5\pi}{8} + \pi n$



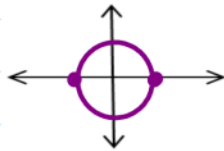
$\frac{1}{2}(2x) = (\frac{7\pi}{4} + 2\pi n) \frac{1}{2}$

$x = \frac{7\pi}{8} + \pi n$

19) $\tan 3x(\tan x - 1) = 0$

$\tan 3x = 0$

tan



$\frac{3x}{3} = \frac{0 + \pi n}{3}$

$x = 0 + \frac{\pi n}{3}$

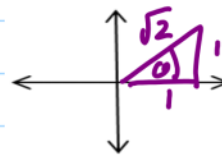
$\frac{3x}{3} = \frac{\pi + \pi n}{3}$

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

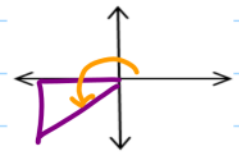
period = $\frac{\pi}{6} = \frac{\pi}{3}$

$\tan x - 1 = 0$

$\tan x = 1$



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



$x = \frac{5\pi}{4} + \pi n$

period = $\frac{\pi}{6} = \pi$

$\tan 3x = 0$ or $\tan x - 1 = 0$

$3x = n\pi$

$\tan x = 1$

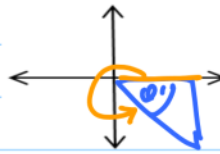
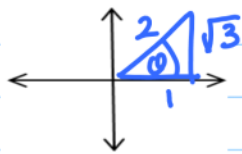
$x = \frac{n\pi}{3}$

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

* you can consolidate answers

Solve the multiple-angle equation.

$$35) \cos 2x = \frac{1}{2} \quad \frac{S(A)}{T(C)}$$



$$\frac{1}{2}(2x) = \left(\frac{\pi}{3} + 2\pi n\right) \frac{1}{2}$$

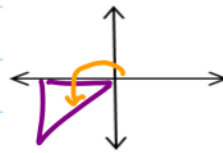
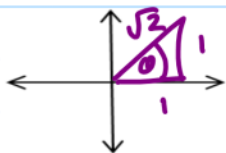
$$x = \frac{\pi}{6} + \pi n$$

$$\frac{1}{2}(2x) = \left(\frac{5\pi}{3} + 2\pi n\right) \frac{1}{2}$$

$$x = \frac{5\pi}{6} + \pi n$$

$$\text{Period} = \frac{2\pi}{2} = \pi$$

$$37) \tan 3x = 1 \quad \frac{S(A)}{T(C)}$$



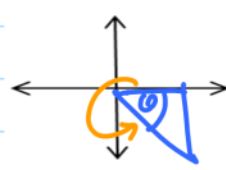
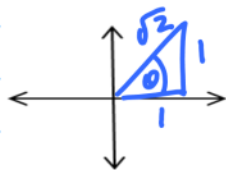
$$\frac{1}{3}(3x) = \left(\frac{\pi}{4} + \pi n\right) \frac{1}{3}$$

$$x = \frac{\pi}{12} + \frac{\pi n}{3}$$

$$\frac{1}{3}(3x) = \left(\frac{5\pi}{4} + \pi n\right) \frac{1}{3}$$

$$x = \frac{5\pi}{12} + \frac{\pi n}{3}$$

$$39) \cos \frac{x}{2} = \frac{\sqrt{2}}{2} \cdot \frac{\sqrt{2}}{\sqrt{2}} = \frac{1}{\sqrt{2}} \quad \frac{S(A)}{T(C)}$$



$$2\left(\frac{x}{2}\right) = \left(\frac{\pi}{4} + 2\pi n\right) 2$$

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

$$2\left(\frac{x}{2}\right) = \left(\frac{7\pi}{4} + 2\pi n\right) 2$$

$$x = \frac{7\pi}{2} + 4\pi n$$