

Friday - October 31, 2014

$$(82) \sec^2 x + \tan x = 3$$

$\in [0, 2\pi)$

$$\frac{1}{\cos^2 x} + \tan x = 3$$

$$\frac{1}{\cos^2 x} + \frac{\sin x}{\cos x} - 3 = 0$$

$$\frac{1}{\cos x}(\frac{1}{\cos x} + \sin x) - 3 = 0$$

$$x = \tan x$$

$$x^2 + x - 2 = 0$$

$$(x-1)(x+2) = 0$$

$$\tan x - 1 = 0 \quad \tan x + 2 = 0$$

$$\tan x = 1 \quad \tan x = -2$$

$$x = \frac{\pi}{4}, \frac{5\pi}{4}, -1.107, 2.034, 5.176$$

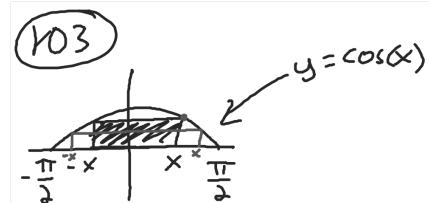
$$(99) y = \frac{1}{12}(\cos 8t - 3\sin 8t)$$

$$[0, 1]$$

$$t = .040$$

$$t = .433$$

$$t = .826$$



$$a) A = 2 \times \cos x$$

$$b) [0.61, 1.10]$$

$$\sim 1.122 \text{ units}^2$$

Unit 7
Day 5 10/31/14

Sum and Difference
Formulas

Sum and Difference Formulas

$$\sin(a+b) = \sin a \cos b + \cos a \sin b$$

$$\sin(a-b) = \sin a \cos b - \cos a \sin b$$

$$\cos(a+b) = \cos a \cos b - \sin a \sin b$$

$$\cos(a-b) = \cos a \cos b + \sin a \sin b$$

$$\tan(a+b) = \frac{\tan a + \tan b}{1 - \tan a \tan b}$$

$$\tan(a-b) = \frac{\tan a - \tan b}{1 + \tan a \tan b}$$

★ P. 377

Evaluate

$$\cos(75^\circ)$$

$$\cos(30^\circ + 45^\circ)$$

$$= \cos 30^\circ \cos 45^\circ - \sin 30^\circ \sin 45^\circ$$

$$= \frac{\sqrt{3}}{2} \cdot \frac{\sqrt{2}}{2} - \frac{1}{2} \cdot \frac{\sqrt{2}}{2}$$

$$= \frac{\sqrt{6}}{4} - \frac{\sqrt{2}}{4} = \boxed{\frac{\sqrt{6}-\sqrt{2}}{4}}$$



$$\sin \frac{\pi}{12}$$

$$\sin\left(\frac{\pi}{3} - \frac{\pi}{4}\right)$$

$$\frac{1}{3} - \frac{1}{4}$$

$$\frac{4}{12} - \frac{3}{12} = \frac{1}{12}$$

$$\sin\left(\frac{\pi}{3}\right)\cos\left(\frac{\pi}{4}\right) - \cos\left(\frac{\pi}{3}\right)\sin\left(\frac{\pi}{4}\right)$$

$$\frac{\sqrt{3}}{2} \cdot \frac{\sqrt{2}}{2} - \frac{1}{2} \cdot \frac{\sqrt{2}}{2}$$

$$\frac{\sqrt{6}}{4} - \frac{\sqrt{2}}{4} = \boxed{\frac{\sqrt{6}-\sqrt{2}}{4}}$$

$$\tan(75^\circ)$$

$$\tan(30^\circ + 45^\circ)$$

$$= \frac{\tan 30^\circ + \tan 45^\circ}{1 - \tan 30^\circ \tan 45^\circ}$$

$$= \frac{\frac{\sqrt{3}}{3} + \cancel{\frac{3}{3}}}{\frac{3\cancel{\frac{3}{3}} - \sqrt{3}}{3}(1)} = \frac{\frac{\sqrt{3}+3}{3}}{\frac{3-\sqrt{3}}{3}}$$

$$\begin{aligned}
 &\xrightarrow{\frac{\sqrt{3}+3}{3} \cdot \frac{3}{3-\sqrt{3}}} \\
 &= \frac{\sqrt{3}+3}{3-\sqrt{3}} \cdot \frac{3+\sqrt{3}}{3+\sqrt{3}} \\
 &= \frac{9+3\sqrt{3}+3\sqrt{3}+3}{6} \\
 &= \frac{12+6\sqrt{3}}{6} \\
 &= \boxed{2+\sqrt{3}}
 \end{aligned}$$