

Friday - October 31, 2014

82 $(\sec^2 x) + \tan x = 3$
 $\frac{1}{\cos^2 x} + \tan x = 3$
 $\tan^2 x + \tan x - 2 = 0$
 $x^2 + x - 2 = 0$
 $(x-1)(x+2) = 0$
 $\tan x - 1 = 0$ $\tan x + 2 = 0$
 $\tan x = 1$ $\tan x = -2$
 $x = \frac{\pi}{4}, \frac{5\pi}{4}, -1.107, 2.034, 5.176$

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

$[0, 1]$ $t = .040$
 $t = .433$
 $t = .826$

103 $y = \cos(x)$

a) $A = 2x \cos x$
 $\sim 1.122 \text{ units}^2$

b) $[.61, 1.10]$

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

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

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

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

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

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



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

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

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

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

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

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

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

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

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

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

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

$$= \frac{\frac{\sqrt{3} + 3}{3}}{\frac{3 - \sqrt{3}}{3}}$$

$$\frac{\sqrt{3} + 3}{3} \cdot \frac{3}{3 - \sqrt{3}}$$

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

$$= \frac{9 + 3\sqrt{3} + 3\sqrt{3} + 3}{6}$$

$$= \frac{12 + 6\sqrt{3}}{6}$$

$$= 2 + \sqrt{3}$$