§2.4 I by Friday

§2.4 II Monday

Mar 26-8:54 AM

(31) $\tan(\alpha+\beta) = \dfrac{\tan\alpha+\tan\beta}{1-\tan\alpha\tan\beta}$

$$\frac{\tan 45^\circ - \tan 30^\circ}{1+\tan 45^\circ \tan 30^\circ} = \tan(45^\circ - 30^\circ) = \tan(15^\circ)$$

My answer was $\tan(75^\circ)$

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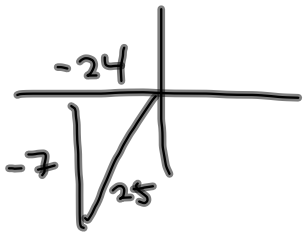
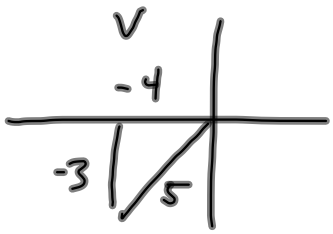
(49) $\tan(u-v) = \dfrac{\tan u - \tan v}{1+\tan u\tan v} = \dfrac{\frac{7}{24} - \frac{3}{4}}{1+\left(\frac{7}{24}\right)\left(\frac{3}{4}\right)}$

$\sin u = -\frac{7}{25}$, $\cos v = -\frac{4}{5} = -\frac{20}{25}$





$\sqrt{625-49}$

$= \sqrt{576} = 2 \cdot 12 = 24$

$$= \frac{\frac{7-18}{24}}{1+\frac{7}{32}} = \frac{\frac{-11}{24}}{\frac{39}{32}}$$

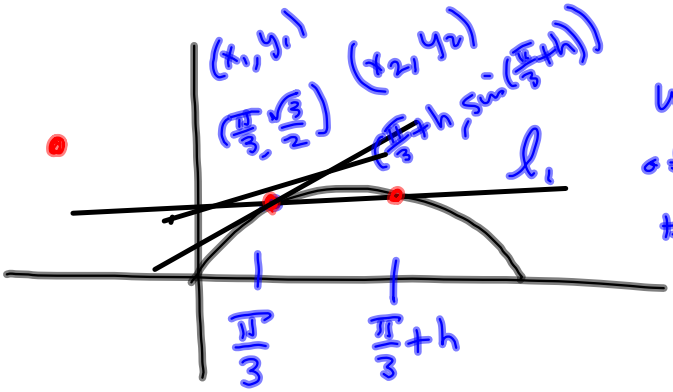
$$= -\frac{11}{\cancel{24}_{3}} \cdot \frac{\cancel{32}^{4}}{39} = \boxed{\frac{-44}{117}}$$

78
139
117

$2 \mid 576$
$2 \mid 288$
144

Recall: Average Slope of a Function

Slope of $\sin x$



Want the slope of $\sin x$ at $x = \frac{\pi}{3}$

Here's how we Do It:

$f(\frac{\pi}{3}) = \frac{\sqrt{3}}{2}$

Slope of l_1 gives us an approximation for the slope of $f(x) = \sin x$ @ $x = \frac{\pi}{3}$

$$m = \frac{y_2 - y_1}{x_2 - x_1} = \frac{\sin(\frac{\pi}{3}+h) - \sin\frac{\pi}{3}}{\frac{\pi}{3}+h - \frac{\pi}{3}}$$

$$= \frac{\sin\left(\frac{\pi}{3}+h\right)-\sqrt{3}}{h}$$

S2.4 #85 Example 8

$$= \frac{\sin\frac{\pi}{3}\cos h + \cos\frac{\pi}{3}\sin h - \frac{\sqrt{3}}{2}}{h}$$

Bryan

$$= \frac{\frac{\sqrt{3}}{2}\cos h + \frac{1}{2}\sin h - \frac{\sqrt{3}}{2}}{h}$$

For #85, make darn sure your calculator is in radians mode!

$$= \frac{\frac{\sqrt{3}}{2}(\cos h - 1) + \frac{1}{2}\sin h}{h}$$

$$= \frac{\sqrt{3}}{2}\left(\frac{\cos h - 1}{h}\right) + \frac{1}{2}\left(\frac{\sin h}{h}\right)$$

$\to 0$ as $h \to 0$; $\to 1$ as $h \to 0$

$$\frac{\sin(x+h)-\sin(x)}{h} = \cdots = \sin x\left(\frac{\cos h - 1}{h}\right) + \cos x\left(\frac{\sin h}{h}\right)$$

in general.

#85 makes you plug in a bunch of h-values into this difference quotient.