

Good afternoon: Warm up in notebooks please

Write equation of the tangent line where $g(x)$ has a vertical tangent.

$$g(x) = 3x\sqrt{2x-4} = \frac{3x \cdot (2x-4)^{1/2}}{f \quad g}$$

$$f: 3x$$

$$f': 3$$

$$g: (2x-4)^{1/2}$$

$$g' = \frac{1}{2}(2x-4)^{-1/2} \cdot 2 = (2x-4)^{-1/2}$$

$$\begin{aligned} x^5 + x^7 \\ x^5(1+x^2) \end{aligned}$$

$$f'g + fg'$$

$$3 \cdot (2x-4)^{1/2} + 3x \cdot (2x-4)^{-1/2}$$

$$3(2x-4)^{-1/2} \left((2x-4)^1 + x \right)$$



$$\frac{3(2x-4+x)}{(2x-4)^{1/2}}$$

$$\rightarrow \frac{9x-12}{\sqrt{2x-4}}$$

$$\text{# } 0. \text{ Tangent} = 0$$

$$2x-4=0$$

$$\underline{\underline{x=2}}$$

Linearization

Hw answers are on back :P

Any questions?

NOTES

Find a linear approximation for $\sin(\pi/7)$

Try w/o calculator!

$$y = \sin x$$

$$y - \frac{1}{2} = m(x - \pi/6)$$

}

$$\frac{\sqrt{3}}{2}$$

$$y - \frac{1}{2} = \frac{\sqrt{3}}{2} (\cancel{\pi/6} - \pi/6)$$

$$y - \frac{1}{2} = \frac{\sqrt{3}}{2} \left(\frac{\pi}{7} - \frac{\pi}{6} \right)$$

$$y = \frac{\sqrt{3}}{2} \left(\frac{6\pi}{42} - \frac{7\pi}{42} \right) + \frac{1}{2}$$

$$\frac{\sqrt{3}}{2} \cdot \frac{-1\pi}{42} + \frac{1}{2}$$

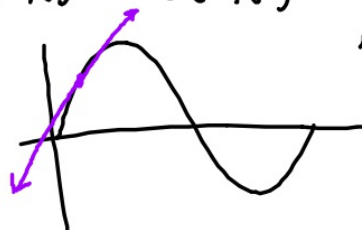
$$\frac{-\sqrt{3} \cdot \pi}{84} + \frac{1}{2}$$

$$\frac{-\pi\sqrt{3} + 42}{84}$$

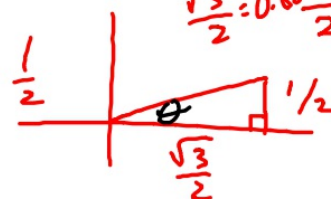
guess: $\sin \pi/6 = \frac{1}{2}$
 $\left(\frac{\pi}{6}, \frac{1}{2} \right)$
 $x \quad y$

$$y' = \cos x$$

$$y'(\pi/6) = \cos(\pi/6) = \frac{\sqrt{3}}{2}$$



$$\frac{\sqrt{3}}{2} = 0.866 \frac{1}{2} = 0.5$$



The Tangent Line Game :)

Given

10 functions

10 first derivatives

10 equations of tangent lines

Match 'em!

HW for Wednesday

Derivative Bingo: Get 2 bingos

Review: Do #2-28 (even)