§ 2.4 Assignment Posted.

To work ahead, just go to
not-done-yet
in the Homework solutions.

All I'm doing is re-numbering
& re-packaging.

$$\frac{d}{dx}\left[x - \frac{x^3}{3!} + \frac{x^5}{5!} - \cdots \right]$$

$$= 1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \cdots$$

$$\frac{d}{dx}\left[\text{above}\right] = -x + \frac{x^3}{3!} - \frac{x^5}{5!} + \cdots$$

Suppose $x=3$, $x=1-\sqrt{2}$, $x=1+\sqrt{2}$ are zeros of $7x^3-35x^2+35x-21 = f(x)$. Then you instantly know

$$f(x) = 7(x-3)(x-(1-\sqrt{2}))(x-(1+\sqrt{2}))$$

FACTOR THEOREM

2.5

$$y = \underbrace{x}_{f}\,\underbrace{\sec(kx)}_{g}.$$ The 'k' is Konstant.

$$\Rightarrow y' = \underbrace{1}_{f'}\,\underbrace{\sec(kx)}_{g} + x\sec(kx)\tan(kx)\cdot k$$

$$\boxed{\sec(kx) + kx\sec(kx)\tan(kx)}$$

~~Naked~~

sec

K

lim

$$(fg)' = f'g + fg'$$

$$3(2+5) = 3\cdot 2 + 3\cdot 5 = 90\,?!$$

$$y = \left(\frac{x^2+1}{x^2-1}\right)^3$$

$$y' = 3\left(\frac{x^2+1}{x^2-1}\right)^2 \left(\frac{(2x)(x^2-1) - (x^2+1)(2x)}{(x^2-1)^2}\right)$$

$$f'g + fg'$$

$$\frac{f'g - fg'}{g^2}$$

$$\left(\frac{g}{f}\right)' = \frac{g'f - gf'}{f^2}$$

$$f(x) = \sin^2(x^3 - 5x)$$

$$\sin^2(x^3 - 5x)$$

$$\frac{df}{dx} = 2\sin(x^3-5x) \cdot (3x^2-5)$$

$$f(\theta) = \sin^2(\theta^3 - 5\theta)$$

$$f'(\theta) = \frac{df}{d\theta} = 2\sin(\theta^3 - 5\theta)(3\theta^2 - 5)$$

Assume $\theta = \theta(t)$. Then

$\frac{df}{d\theta}$ is same, but

$$\frac{df}{dt} = 2\sin(\theta^3 - 5\theta)\left(3\theta^2\frac{d\theta}{dt} - 5\frac{d\theta}{dt}\right)$$

$$\theta = \theta(t)$$

$$\frac{d}{dt}\left[\theta^3 - 5\theta\right] = 3\theta^2\frac{d\theta}{dt} - 5\frac{d\theta}{dt}$$

2.4 on Board monday

REMIND ME OF THIS, MONDAY

$\sin^2(\theta^3-5\theta) = \left(\sin(\theta^3-5\theta)\right)^2$

$f = u^2$

$u = \sin(v)$

$v = \theta^3-5\theta$

$\frac{d}{d\,\cancel{}}\left[\cancel{}^2\right] = 2\,\cancel{}'$

$\frac{d}{d(\sin(\theta^3-5\theta))}\left[\sin(\theta^3-5\theta)^2\right]$

$f(u(v(\theta)))$

$= \underline{2\sin(\theta^3-5\theta)}\cos(\theta^3-5\theta)(3\theta^2-5)$

$\frac{df}{du} \cdot \frac{du}{dv} \cdot \frac{dv}{d\theta}$