Assignments for the Week of Sept 26:

- Read 2.4, 5.1,5.4,5.5,5.6 (only derivative examples from Ch 5)
- 45 minutes of Khan Academy
- Due Fri. 30 Sept:

• 2.4 #7-33 odd; 43-89 odd	Chain rule
• 5.1 #41-59 odd; 69,71	Logarithmic functions
• 5.4 #33-51 odd; 59, 61	Exponential functions
• 5.5 #37-69 odd	Log and exp functions with other bases
• 5.6 #39-63 odd	Inverse trig functions

$$\left(\frac{1}{4}\sin^2 2\theta\right)' = \left[\frac{1}{4}(\sin 2\theta)^2\right]'$$

$$= \frac{1}{4} \cdot 2 \sin 2\theta \cdot \cos 2\theta \cdot 2$$

$[x^n]' = nx^{n-1}$

$[cf(x)]' = cf'(x)$

$[f(x) \pm g(x)]' = f' \pm g'$

$[f(x)g(x)]' = f'g + fg'$

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

$[f(g(x))]' = f'(g(x)) \cdot g'(x)$

$[e^x]' = e^x$

$[a^x]' = a^x \ln a$

$[\ln x]' = \frac{1}{x}$

$[\log_a x]' = \frac{1}{x \ln a}$

$[\sin x]' = \cos x$

$[\cos x]' = -\sin x$

$[\tan x]' = \sec^2 x$

$[\cot x]' = -\csc^2 x$

$[\sec x]' = \sec x \tan x$

$[\csc x]' = -\csc x \cot x$

$[\arcsin x]' =$

$[\arctan x]' =$

$[\operatorname{arcsec} x]' =$

$[\arccos x]' =$

$[\operatorname{arccot} x]' =$

$[\operatorname{arccsc} x]' =$

$$f(x) = \sqrt[3]{\sin^2(\ln(4x^9))} = \left[(\sin[\ln(4x^9)])^2\right]^{1/3}$$

$$= [\sin(\ln[4x^9])]^{2/3}$$

$(x^m)^n = x^{mn}$

$$f'(x) = \frac{2}{3}[\sin(\ln[4x^9])]^{-1/3} \cdot \cos(\ln[4x^9]) \cdot \frac{1}{4x^9} \cdot 36x^8$$

$$f(x) = 5^{\sqrt[3]{4\log_2(3x^2-4x)}} = 5^{[4\log_2(3x^2-4x)]^{1/3}}$$

$$f'(x) = 5^{\sqrt[3]{4\log_2(3x^2-4x)}} \cdot \ln 5 \cdot \frac{1}{3}[4\log_2(3x^2-4x)]^{-2/3} \cdot 4 \cdot \frac{1}{(3x^2-4x)\ln 2} \cdot (6x-4)$$

$$\log_a MN = \log_a M + \log_a N$$

$$\log_a \frac{M}{N} = \log_a M - \log_a N$$

48. $y = \ln\left(\frac{1+e^x}{1-e^x}\right) = \ln(1+e^x) - \ln(1-e^x)$

$$y' = \frac{1}{1+e^x} \cdot e^x - \frac{1}{1-e^x} \cdot (-e^x)$$

$$= \frac{e^x}{1+e^x} + \frac{e^x}{1-e^x}$$

58. $y = \ln e^x = x$

$$y' = 1$$