Panther ID: _____ **NAME:** _____

MAC 2311: Worksheet Sep. 27, 2016

1) Compute the following derivatives. Do not simplify your answer.
a) $\frac{d}{dx}\left((x^2-3x+2)(x^3-4x^2+5)\right)$
b) $\frac{d}{dx}\left((\sqrt{x}-7)(\frac{5}{x}-7x+10)\right)$

2) Compute the following derivatives. Do not simplify your answer.
a) $\frac{d}{dx}\left(\frac{x^7-3x+1}{5x+2}\right)$
b) $\frac{d}{dx}\left(\frac{\sqrt{x}-1}{\sqrt{x}+1}\right)$

3) Prove that the power law, $(d/dx)(x^n) = nx^{n-1}$ holds when n is a negative integer by combining the quotient law and the power law for positive integers.

4) Use the angle addition formula

$$\cos(A + B) = \cos A \cos B - \sin A \sin B \ ,$$

to prove that $(\cos x)' = -\sin x$.

5) Use your knowledge of the derivatives of $\sin x$ and $\cos x$ and the quotient law to find the formulas for the derivatives of $\tan x$ and $\sec x$.

6) Show that $y = x \sin x$ is a solution to the differential equation $y'' + y = 2 \cos x$.