Math 1030 Workshop #4 **Name:** _____

DUE: Tuesday, July 26^{th} Please turn in a paper copy and **SHOW YOUR WORK!**

1. Use the limit definition of the derivative to find $f'(x)$ if...
   [You use should the rules we learned to double check your answer.]

   (a) $f(x) = x^3 - 4x + 1$

   (b) $f(x) = \dfrac{1}{2x - 1}$

2. Find the equation of the line tangent to the graph of $y = f(x)$ at $x = x_0$ if...

   (a) $f(x) = x^3 - 4x + 1$ and $x_0 = 1$

   (b) $f(x) = \dfrac{1}{2x - 1}$ and $x_0 = 0$

3. Compute the derivative of each of the following functions. Please simplify your answers.

(a) $y = \sqrt{x} + 7e^x - 21\ln(x) + \frac{1}{x^5} - 3x + 11$

(b) $y = \ln(x)e^{3x+1}$

(c) $y = \dfrac{x^3 - x^2 + 4}{1 - xe^x}$

(d) $y = (\ln(2x+1) + 15)^{80}$

(e) $y = \ln\left(\dfrac{e^{5x}\sqrt{x-7}}{(x^2+5)^6}\right)$