

Name:

# Math 116 Practice Exam 1

October 6, 2010

1) (8 points) Find the first derivative for the following functions.

a)  $h(x) = \ln(26x^2 + 4)$

b)  $f(x) = \sin(x) \cdot 7^{x^2}$

c)  $g(x) = \arctan(\sqrt{x+2})$

2) Solve the following non-calculus problems.

a) Find  $\sin(\arctan(\sqrt{41}))$

b) You have an investment opportunity! Bill Gates offers you \$1200 worth of Microsoft stock. Steve Jobs offers you \$800 of Apple stock. You may only accept one of their offers. If the Microsoft stock accrues interest at the rate of 6% a year and the Apple stock at 8% a year, both compounded continuously, how much will each return after 4 years, and which is the better investment?

**3)** Compute the following limits.

a)  $\lim_{x \rightarrow -9^-} (27 + 3x) \csc(-11x - 99)$

b)  $\lim_{x \rightarrow \infty} x^{4/x}$

4) Evaluate the following integrals.

a)  $\int x^4 \sin(3x) dx$

b)  $\int_0^{e^2-1} \frac{x^2 + 1}{2x^2 - 16x - 18} dx$

c)  $\int \frac{3x^8}{1 + x^6} dx$