Math 2250 Exam 2 March 6, 2008

Name:_____ (100 points total)

1. (18 points) Find an equation of the tangent line to the curve $y^3 = 8 + 5xy^2 - \sin x$ at the point $(0, 2)$.

2. (18 points) A television camera is positioned 4000 ft from the base of a rocket launching pad. A rocket rises vertically and its speed is 400 ft/sec when it has risen 3000 ft. How fast is the distance from the television camera to the rocket changing at that moment?

3. (42 points) Find y' for the following functions. **Do not simplify**.

(a) $y = (\ln x)^{\tan x}$

(b) $y = 5x^2 \tan^{-1}(7x^2 + 5)$

(c) $y = \dfrac{\sqrt[5]{x} + x}{e^x + x^2}$

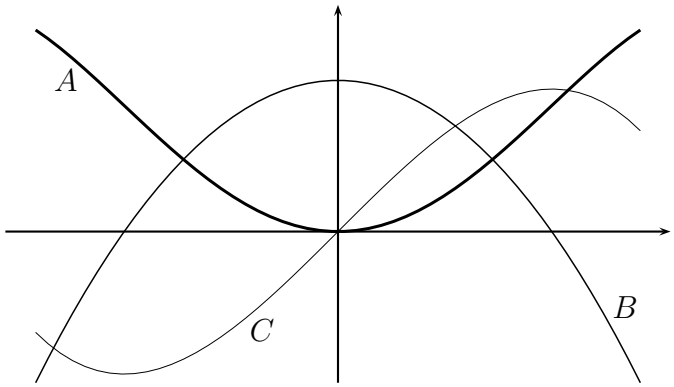
(d) $y = \sin^5(x\cos(x))$

4. (10 points) Identify the graphs A, B, and C as the graphs of a function and its derivatives:

___ is the graph of the function

___ is the graph of the function's first derivative

___ is the graph of the function's second derivative



5. (12 points) A rock shot vertically upward from the roof of a 180 foot building on the planet Tatooine reaches a height of $s(t) = -3t^2 + 12t + 180$ meters in t seconds. What is the velocity of the rock when it strikes the surface of the planet?