NAME: _____ **Section:** _____

SAMPLE - Quiz 1 [10 pts]. January 27, 2009 **Math 221 Sec 02xx**

1. Find the first and second derivative of the functions:
   (a) $f(x) = 3x^3 + 2x - 1$

   (b) $g(x) = \dfrac{2x^3 - 1}{\sqrt{x+1}}$

   (c) $h(x) = e^{2x^2}$

2. Find the area of the region enclosed by the graphs of $y = x^2 + 1$ and $y = 3x + 1$. (Hint: this problem requires you to solve an integral.)

3. Find a pair of positive numbers x and y whose product is 36, and whose sum is as small as possible. (Hint: this is an optimization problem, chapters 2.5 and 2.6.)

4. Using the back of this sheet, sketch the graph of the curve given by $y = 3x^2 - 2x - 1$, including the x and y intercepts. Use the first and second derivative rules to find and label all maximum and minimum points.