Math 1210 − Recitation #3 $\qquad$ **Winter 2012**

Name: $\qquad\qquad$ **A#:**

1. Find the derivative of each of the following. ***Do not* simplify your answers.**

   (a) $f(x) = 2x^5 + 7x^{2/3} - \dfrac{3}{x^4} - 4\pi^3 + \dfrac{8}{3\sqrt[5]{x}} + 2x(1 + x^2)$

   (b) $f(x) = (3x^2 + 1)^4 \left(\dfrac{2}{x} + 1\right)^{3/4}$

   (c) $f(x) = \left(\dfrac{7x + 3\sqrt{x^6 + \pi}}{1 - x^3}\right)^5$

2. Find the 10th derivative of $g(x) = \dfrac{1}{1 - 2x}$.

3. Consider the curve defined by $y = \dfrac{x+1}{x^2+3}$.

   (a) What is the equation of the tangent line to this curve at $x = 2$?

   (b) At what points is the tangent line to the curve horizontal?

   (c) Where does this curve cross the x and y axes?

   (d) What happens to the value of y as x becomes very large and positive? What happens to y as x becomes very large and negative?

   (e) Use the information obtained in (b)–(d) to sketch this curve.