Name: _____

Calculus Practice Quiz #6

This quiz is to determine if you have mastered the material by attending tutoring sessions and completing your homework. Please write legibly and show as much work as possible for each problem.

1. Find a formula for dy/dx for each function below.

   a. $\ln xy = x^2 + y$

   b. $y = \left(e^{-x^2} - 1\right)^{1/2}$

   c. $y = \ln \dfrac{(3x+4)^5}{\sqrt{2x+9}}$

   d. $y = \dfrac{\sqrt[5]{2x+1}(3x+9)^{17}}{(7x-3)^{23}}$

2. Find the intervals where each function is increasing/decreasing and relative extrema.

   a. $f(x) = \sqrt{x} - 3\ln x$

   b. $f(x) = \dfrac{6(x-3)^2}{e^{2x}}$

3. Evaluate each definite or indefinite integral.

   a. $\int \dfrac{x^3}{4-x^2}\,dx$

   b. $\int \dfrac{\cos x}{5+2\sin x}\,dx$

   c. $\int_e^{e^4} \dfrac{dx}{x(4+2\ln x)}$

   d. $\int \dfrac{x^3 - 5x + 3}{x-2}\,dx$

4. Find the average value of f(x) = tan 2x on the interval (0,π/6).