

Problem Set I: Due Friday, February 20, 2009
Spring 2009

Math 141
Dr. Wiglesworth

Name: _____

You must *show all work* to receive full credit.

Answers and assertions must be fully explained and justified.

Your solutions must be clear, concise, and easy to follow.

You must cite any sources used for this assignment.

1. Find all roots, holes, and asymptotes of the following functions. Then calculate the derivative using the quotient rule, find the critical points, find all local extrema, and find all global extrema. Finally, use your results to sketch an accurate graph of the function.

(a) $f(x) = \frac{x^4 - 2x^3 - 3x^2 + 4x + 4}{x^2 - x - 2}$

(b) $g(x) = \frac{\frac{3x+1}{x-1}}{\frac{x^2-4}{x+5}}$

2. Determine the domain of the given functions. Then, determine the y -intercept of the functions.

(a) $f(x) = \frac{1}{4^x} - \frac{5}{2^x} + 4$

(b) $g(x) = 4 \ln(2x^2 - 3) - 7$

3. Calculate the derivatives of the following functions.

(a) $f(x) = 2e^{3x+1}$

(b) $g(x) = \frac{2}{4+e^{-2x}}$