In-Class Assignment 1

MATH 142-02
Tuesday, January 20, 2009

Directions: Work neatly on a separate sheet of paper. Your group will hand in one write-up with everyone’s name on it. DO NOT fold the corner over to hold everything together! Work together on each problem; do not delegate different problems to different people.

Calculus I Review

1. Differentiate each function.
   (a) \( f(x) = (x^{2/3} + x^{1/3})^{2/5} \)
   (b) \( x(t) = 6t^4 \sec(t) \)
   (c) \( f(x) = [(x^2 + 1)^2 + 1]^2 \)
   (d) \( f(x) = \sin^2(x) + \cos^2(x) \)
   (e) \( y(t) = \frac{1}{\sqrt{t}} \)
   (f) \( q(x) = \frac{3t^2}{t^3 - 8} \)
   (g) \( w(s) = \frac{s^{3/2} - 1}{s^{3/2} + 1} \)

2. The graph shows the derivative \( f' \) of a function \( f \). Determine each of the following.
   (a) Intervals where \( f \) is increasing and decreasing.
   (b) Intervals where \( f \) is concave up and concave down.
   (c) Local maxima and minima of \( f \).

Sketch a possible graph of \( f \) and a possible graph of \( f'' \) on the same set of axes with \( f' \).