In-Class Assignment 1: Calculus I Review

MATH 142

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.

1. Differentiate each function.

   (a) $f(x) = (x^{2/3} + x^{1/3})^{2/5}$

   (b) $g(t) = e^t \tan t$

   (c) $f(x) = [(x^2 + 1)^2 + 1]^2$

   (d) $f(x) = \sin^2(x) + \cos^2(x)$

   (e) $y(t) = \dfrac{1}{\sqrt{t}}$

   (f) $w(s) = \dfrac{s^{3/2} - 1}{s^{3/2} + 1}$

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'.