Math 2250 HW #10

Due 1:25 PM Friday, October 21

Reading: Hass §4.1–4.3

Problems: Do the assignment "HW10" on WebWork. In addition, write up solutions to the following two problems and hand in your solutions in class on Friday.

1. Find the absolute maximum and minimum values of the function $g(x) = e^{-x^2}$ subject to the constraint $-2 \leq x \leq 1$.

2. Find all local maxima and minima of the curve $y = x^2 \ln x$.

3. A general cubic function has the form

$$f(x) = ax^3 + bx^2 + cx + d$$

where a, b, c, and d are constants.

   (a) Give examples that demonstrate such functions can have 0, 1, or 2 critical points.

   (b) Show that no cubic function can have *more* than 2 critical points.

   (c) How many local extreme values (maxima and/or minima) can a cubic function have?