Math 2250 HW #12

Due 1:25 PM Friday, November 4

Reading: Hass §4.5–4.6

Problems: Do the assignment "HW12" on WebWork. In addition, write up solutions to the following problems and hand in your solutions in class on Friday.

1. Consider
$$f(x) = \frac{1}{4x^2 + 7}$$
   (a) Find all critical points of $f(x)$. For each one determine whether it is a local maximum, a local minimum, or neither.
   (b) If it exists, what is the absolute maximum of $f(x)$? If it exists, what is the absolute minimum?
   (c) Find the inflection points of $f(x)$ and determine on what intervals the graph of $f(x)$ is concave up and on what intervals it is concave down.
   (d) Using the information in (a)–(c), sketch the graph of $f(x)$.

2. Evaluate the limit
$$\lim_{x \to 0} \frac{8x(1 - \cos x)}{x - \sin x}$$

3. Evaluate the limit
$$\lim_{x \to -\infty} x^3 e^x.$$