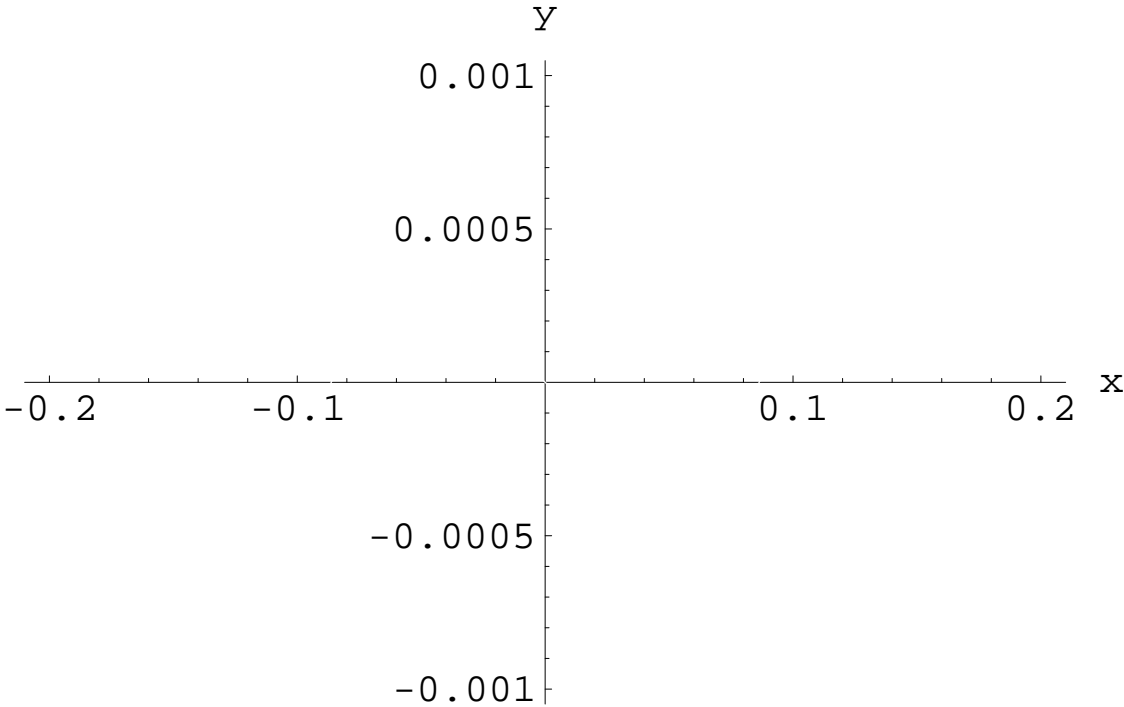


(c) Find the local extrema of the function, if any. Classify each extremum as a local minimum or local maximum.

(d) Find the points of inflection of the function (if any) and the intervals where the graph of the function is concave up and concave down.

(e) Sketch a graph of the function on the axes provided below.



2. (10 points) An advertisement consists of a rectangular printed region plus 1-inch margins on the sides and 2-inch margins on the top and bottom. The area of the printed region is to be 92 inch^2 . Find the dimensions of the printed region that minimize the total area of the advertisement.

3. (8 points each) Find the exact values of the following limits, if they exist.

(a) $\lim_{x \rightarrow 1} \frac{e^{x-1} - 1}{x^2 - 1}$

(b) $\lim_{x \rightarrow 0^+} (\cos x)^{1/x}$

4. (10 points) A camera tracks the launch of a vertically ascending spacecraft. The camera is located at ground level 5 miles from the launchpad. If the spacecraft is 4 miles up and traveling at 0.3 miles per second, at what rate is the camera angle (measured from the horizontal) changing?

5. (7 points each) Evaluate the following indefinite integrals.

(a) $\int \left(2x^{-1} + \frac{1}{\sqrt{x}} \right) dx, \quad x \neq 0$

(b) $\int x^{2/3}(x^{-4/3} - 2) dx$

6. (10 points) Find the absolute extrema of the function $f(x) = x^2e^{-2x}$ on the interval $[0, 2]$. Classify each extremum as an absolute maximum or absolute minimum.