

Test III

November 11, 2002

Math 184H

Name_____

1. Determine all the asymptotes and the relevant limits, intercepts, f' - diagram, and f'' - diagram, and sketch the graph of $y = f(x)$.

$$y = f(x) = x^4 - 18x^2 + 5.$$

2. Determine all the asymptotes and the relevant limits, intercepts, f' - diagram, and f'' - diagram, and sketch the graph of $y = f(x)$.

$$y = f(x) = \frac{x^2 + 2x}{x^2 - 1}.$$

3. Determine all the asymptotes and the relevant limits, intercepts, f' - diagram, and f'' - diagram, and sketch the graph of $y = f(x)$.

$$y = f(x) = e^{-x^2/2}$$

4. Determine all the asymptotes and the relevant limits, intercepts, f' - diagram, and f'' - diagram, and sketch the graph of $y = f(x)$.

$$y = f(x) = \frac{x^2 - 1}{x^3}.$$

5. Show that among all isosceles triangles whose equal sides have length L , the triangle of largest area is a right triangle.

6. A rectangular has its two lower corners on the x -axis and its two upper corners on the curve $y = 4 - x^2$. For all such rectangles, what are the dimensions of the one with largest area?