

Section 5.4: Additional Curve Sketching

Section Objectives: Sketch a graph of a function by

- Finding the domain of the function.
- Determining the symmetries of the functions
- Finding the horizontal and vertical asymptotes
- Finding the x and y intercepts.
- Using the first derivative to find where the function is increasing or decreasing and the relative extrema.
- Using the second derivative to find where the function is concave up or concave down and the inflections points.
- Putting all the above information together.

Practice Problems

1. Let $f(x) = \frac{x^2}{x^2 - 1}$. Use the steps listed above to sketch a graph of the function.

2. Let $f(x) = x \ln(x)$. Use the steps listed above to sketch a graph of the function.

3. Let $f(x) = x^4 - 2x^3 + x^2$. Use the steps listed above to sketch a graph of the function.

More Practice from Textbook 5.4 You should do as many problems from each set (1-6, 7-12, 13-16, 17-24, 25-26, 37-42, 43-52), as needed until you are comfortable with these techniques. 37-42 are good practice for application problems.