

# LECTURE NOTES: 4-5 CURVE SKETCHING (PART 1)

**GUIDELINES OF ALL CURVE SKETCHING PROBLEMS** For each item below, write out in your own words how you actually find that item.

A. **Domain.** Find the domain of the function.

B. **Intercepts** Find any  $x$ - or  $y$ -intercepts.

C. **Symmetry** Determine if the function is even or odd.

D. **Asymptotes** Identify any vertical or horizontal asymptotes.

E. **Intervals of Increase or Decrease** Determine the intervals where the function is increasing and where the function is decreasing.

F. **Local Maximum and Minimum Values** Identify any local maximums and minimums and where they occur.

G. **Concavity and Points of Inflection** Find the intervals where the function is concave up and where the function is concave down. Identify any inflection points.

H. **Sketch the Curve** Plot the curve. Include and label all the bits and pieces above.

**PRACTICE PROBLEM** Sketch the curve  $y = \frac{2x^2}{x^2 - 4}$

- (a) Find the domain.
  
  
- (b) Find the  $x$  and  $y$ -intercepts.
  
  
- (c) Find the symmetries of the curve.
  
  
- (d) Determine the asymptotes.
  - Find the horizontal asymptotes.
  
  
  - Find the vertical asymptotes.
  
  
- (e) Determine where the function is increasing/ decreasing.

(f) Find the local maximum/ minimum values.

(g) Find the intervals of concavity/inflection points.

(h) Sketch the curve.

★ Check your answers using a graphing device!