

## Curve Sketching

### Strategy for Sketching Graphs

1. Determine domain and range
2. Symmetry
3. Intercepts - Find x and y
4. Asymptotes - VA, HA, Oblique
5. Derivatives - Find  $f'$ ,  $f''$
6. Critical points - Find where  $f' = 0$ , DNE and where  $f'' = 0$ , DNE
7. Line up number lines and test intervals in  $f'$  and  $f''$

\_\_\_\_\_  $f'$

\_\_\_\_\_  $f''$

8. Relative Extrema

\_\_\_\_\_  $f'$  or \_\_\_\_\_  $f'$

\_\_\_\_\_  $f''$  or \_\_\_\_\_  $f''$

9. Graph - Find all y-values of important points using the original  $f(x)$ . Plot additional points if needed. Draw in asymptotes, and piece together the 4 possible graphs.

Analyze and sketch the graph of the following functions:

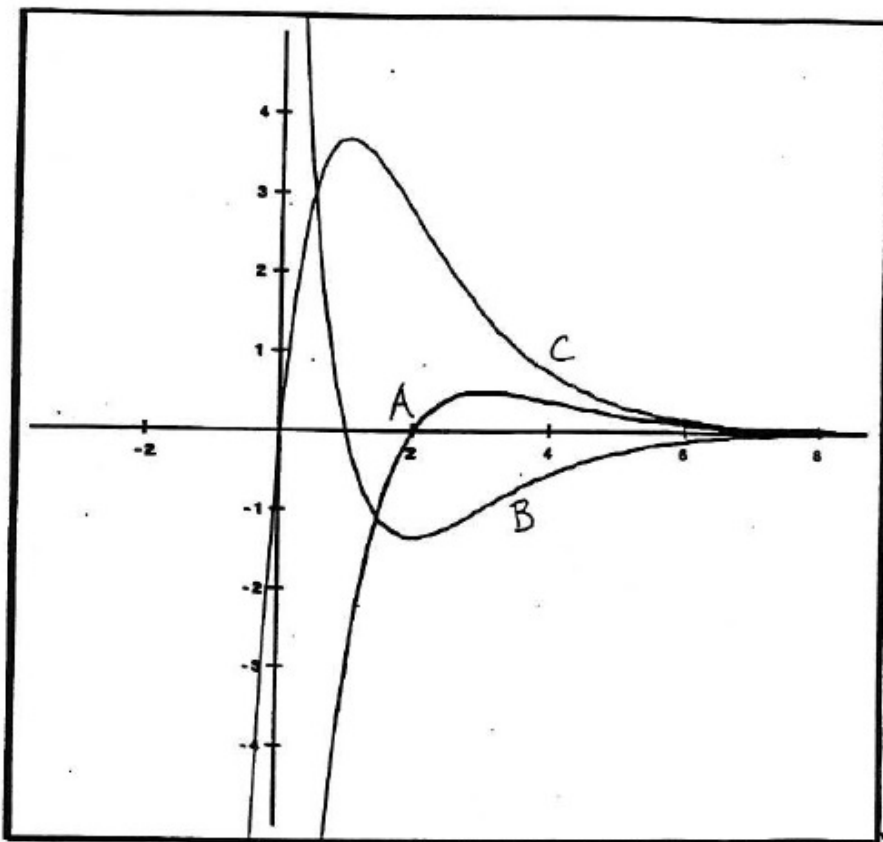
$$f(x) = \frac{x^2}{x^2-9}$$

$$f(x) = \frac{2x^2 - 5x + 5}{x - 2}$$

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

$$f(x) = \frac{10}{2 - 3e^{-\frac{x}{2}}}$$

Identify  $f(x)$ ,  $f'(x)$ , and  $f''(x)$  :



The following graphs are of the first derivative  $f'(x)$ .  
Use the graph to find  $f(x)$ .

