- 1. Consider the function  $f(x) = x^4 2x^2 + 1$ .
  - a) Find the intervals on which f is increasing or decreasing.
  - b) Find the relative min/max of f.
  - c) Find the intervals of concavity and the inflection points.

2. Use the previous problem to sketch the function  $f(x) = x^4 - 2x^2 + 1$ .

3. Consider the function  $f(x) = \frac{x}{\sqrt{x^2+1}}$ . Find the following:

Domain, intercepts, symmetry, asymptotes (horizontal and vertical), intervals of increase or decrease, local min/max, concavity and points of inflection. Use the data to sketch the curve. 4. Find the critical numbers of the function

a) 
$$g(x) = x^{\frac{1}{3}} - x^{\frac{-2}{3}}$$

b) 
$$f(x) = 1 + (x - 3)^2$$
 on  $(-2, 3]$