Sample Questions

Curve Sketching

1. Let $f(x) = \sqrt[3]{x^2 - x^3}$.
   (a) Prove that $f'(0)$ and $f'(1)$ do not exist.
   (b) Find all x such that
      (i) $f'(x) > 0$
      (ii) $f'(x) < 0$
      (iii) $f''(x) > 0$
      (iv) $f''(x) < 0$
   (c) Find all relative maxima, relative minima, and inflexion points of the graph of $f(x)$
   (d) Find all asymptotes of the graph of $f(x)$.
   (e) Sketch the graph of $f(x)$