

3. (12 points) For the function $f(x) = ax^4 - 3x^3$ with constant $a > 0$, use the techniques of calculus to answer the following. Show your work and proper justification for your answers.

(a) Determine all critical points of f . Classify each as a local maximum, a local minimum, or neither.

(b) Determine any global maxima or minima (if any).

(c) Determine all (if any) inflection points.