Name:

For all questions below, use the function

\[ f(x) = 3x^4 - 4x^3 + 6 \]

1. Find all critical points of \( y = f(x) \). Identify each one by its \( x \) coordinate.

2. Use the first derivative test to determine for each critical point of \( f(x) \) whether it is a local minimum, local maximum, or neither.

3. When the domain is restricted to \(-2 \leq x \leq 2\), what is the global maximum and global minimum value of \( f(x) \) over this domain? Name both the value of the function and the \( x \) coordinate where the extreme value occurs.

4. Find all the inflection points of \( y = f(x) \) Name both the \( x \) and \( y \) coordinates of the point(s).

5. On the back, using \( \text{Xmin}=-2 \) and \( \text{Xmax}=2 \) and appropriate values of \( \text{Ymin} \) and \( \text{Ymax} \), sketch a useful graph of \( y = f(x) \). Be sure to label with both the \( x \) and \( y \) coordinates all local extrema, global extrema, and inflection points.