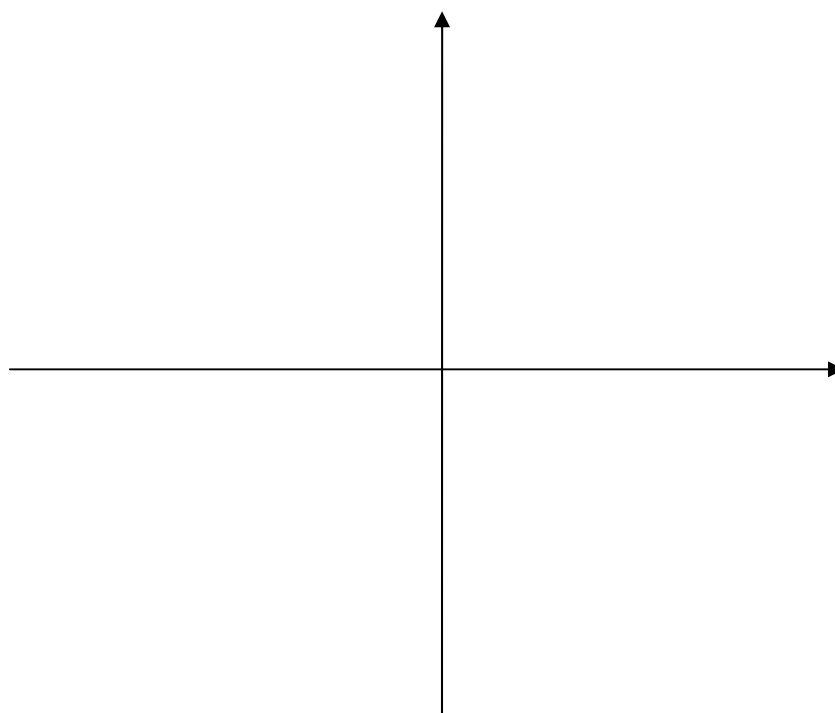


3.6: A Summary of Curve Sketching

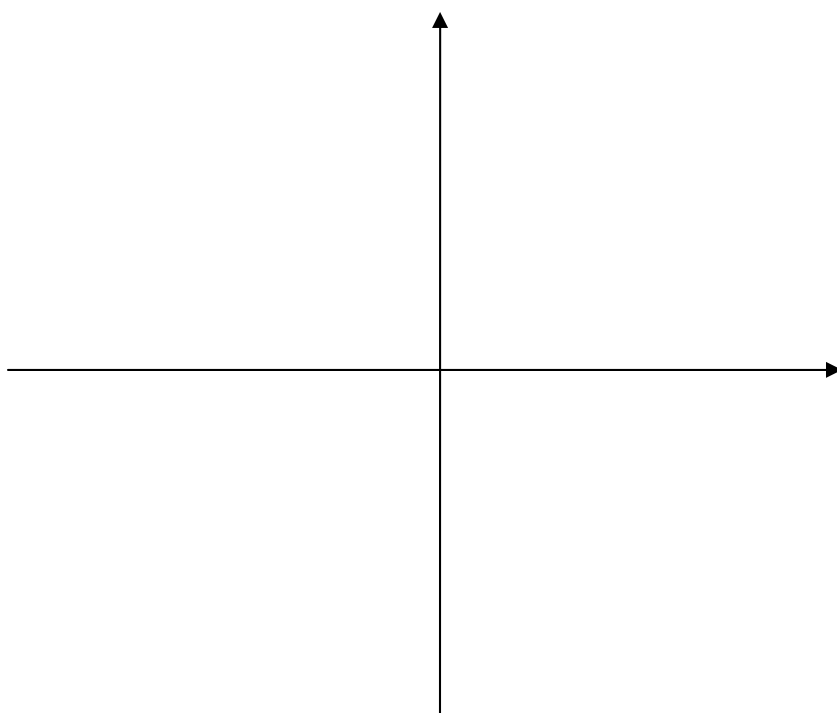
Steps for Curve Sketching

1. Determine the domain of f .
2. Find the x -intercepts and y -intercept, if any.
3. Determine the “end behavior” of f , that is, the behavior for large values of $|x|$ (limits at infinity).
4. Find the vertical, horizontal, and oblique asymptotes, if any.
5. Determine the intervals where f is increasing/decreasing.
6. Find the relative extremes of f , if any. (You should find both the x - and y -values.)
7. Determine the intervals where f is concave up/concave down.
8. Find the inflection points, if any. (You should find both the x - and y -values.)
9. Plot more points if necessary, and sketch the graph.

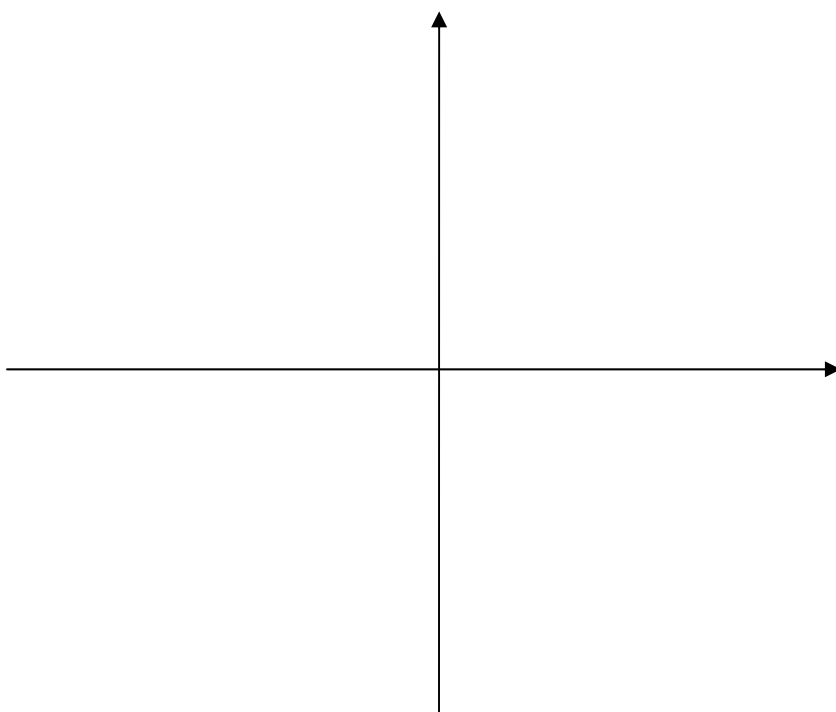
Example 1: Sketch the graph of $f(x) = x^3 - 6x^2 + 9x$.



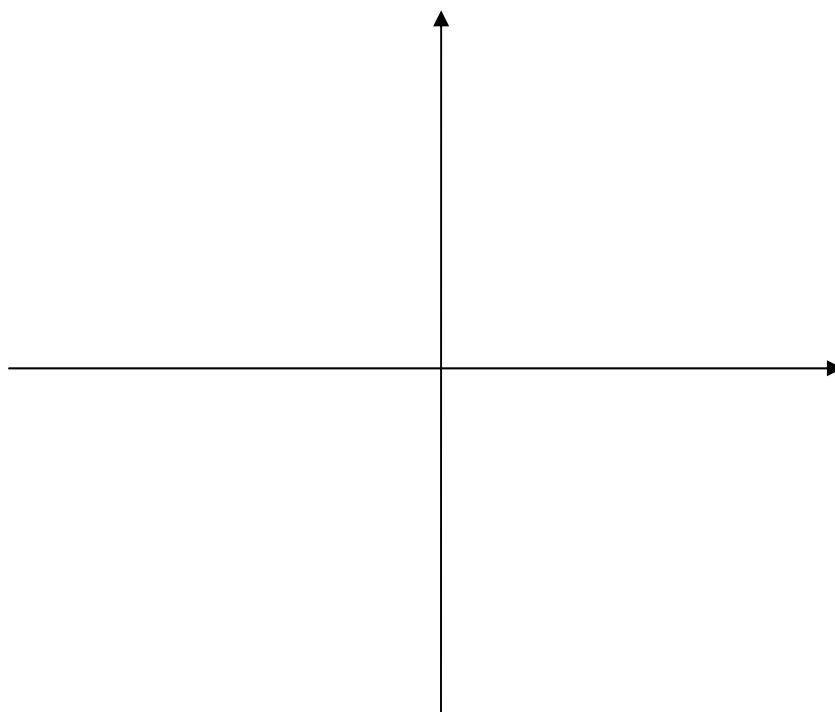
Example 2: Sketch the graph of $f(x) = 3x^4 + 4x^3$.



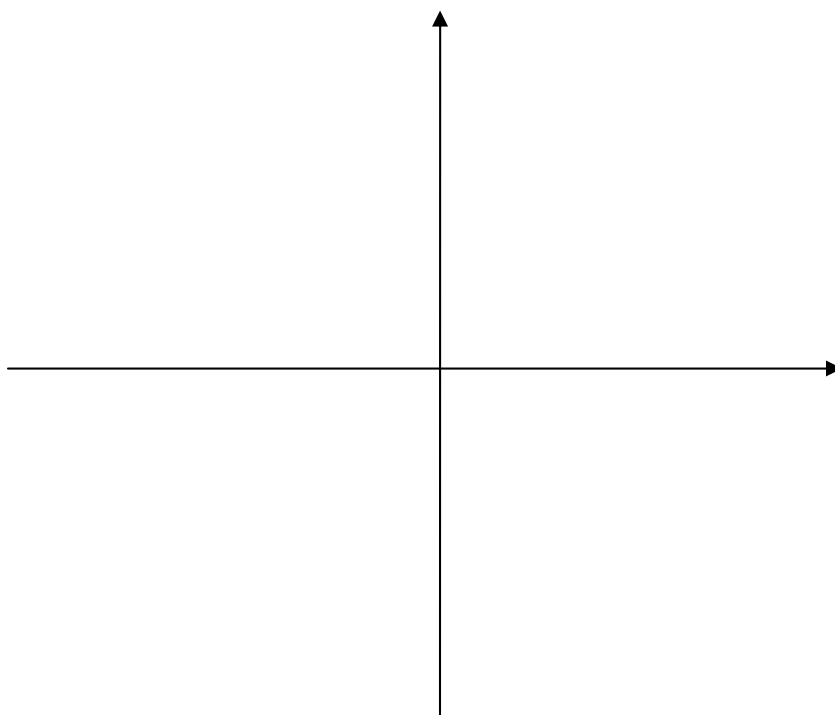
Example 3: Sketch the graph of $f(x) = \frac{2x}{x^2 - 1}$.



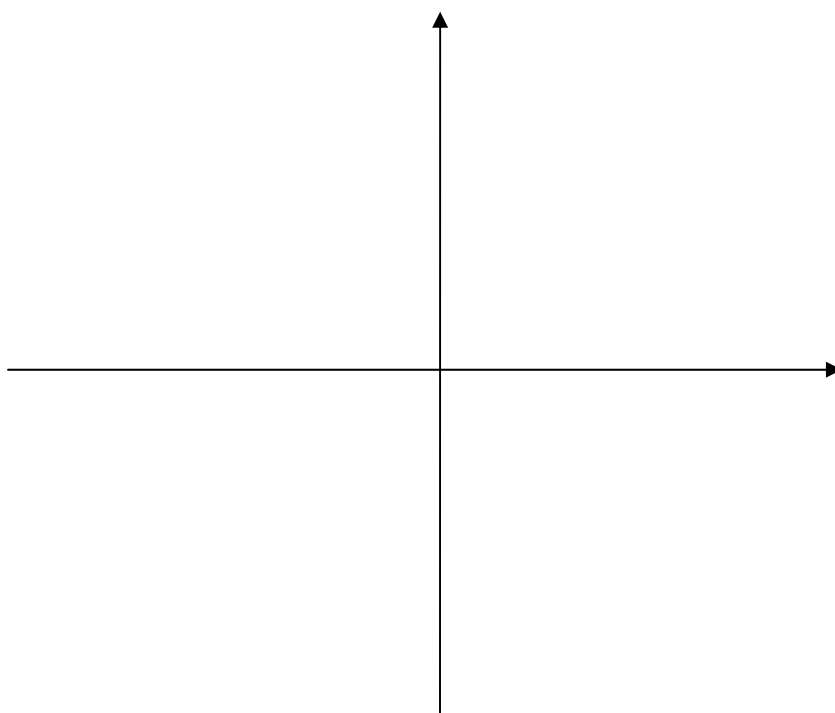
Example 4: Sketch the graph of $f(x) = \frac{x^2 + 1}{x^2 - 4}$.



Example 5: Sketch the graph of $f(x) = \frac{x^2 - 4}{x + 3}$.



Example 6: Sketch the graph of $f(x) = 5x^{2/3} - x^{5/3}$.



Example 7: Sketch the graph of $f(x) = x + \cos x$ on the interval $[-2\pi, 2\pi]$.

