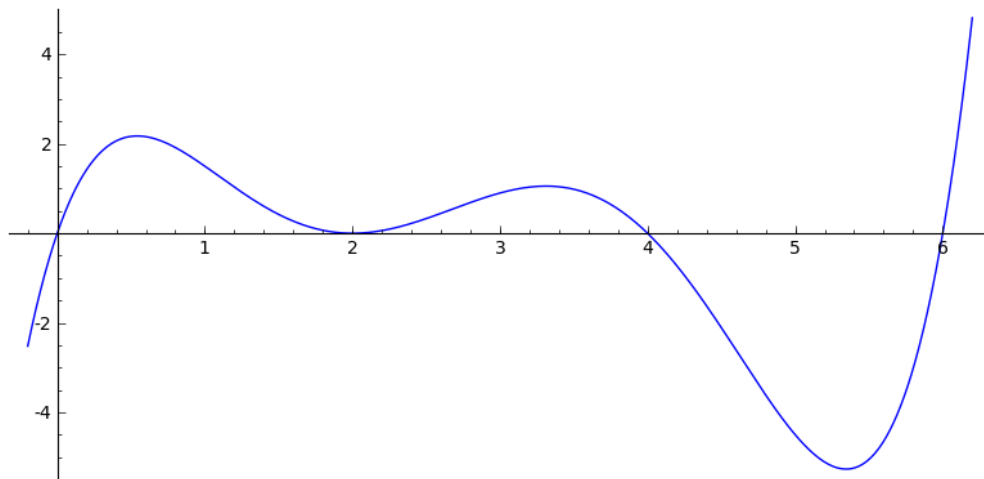**1.** The graph of the derivative f' of a function f is shown.

a) On what intervals is f increasing?

b) At what values of x does f have a local minimum?

c) At what values of x does f have a local maximum?

d) On what intervals is f concave upward?

e) At what values of x does the graph of f have an inflection point?

2. Sketch the graph of a function f that satisfies all of the following:

a) $f'(x) > 0$ for all $x \neq 1$

b) the graph of f has a vertical asymptote at $x = 1$

c) $f''(x) > 0$ for $x < 1$ and for $x > 3$

d) $f''(x) < 0$ for $1 < x < 3$

3. Let $f(x) = (x^2 - 1)^3$. Use the derivatives of f to find the intervals of increase and decrease, any local maximum or minimum values of f, and the intervals of concavity, then use this information to sketch a graph of the function.