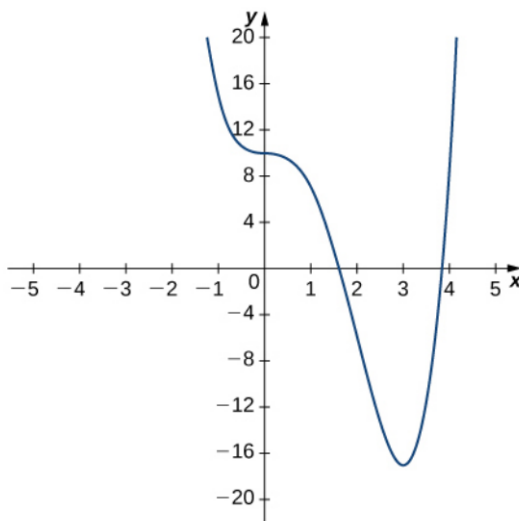## HOMEWORK 4

1. Given the graph of the function $f(x)$ below, sketch the graph of its derivative.

2. Let $f(x) = 3x^2 - \frac{3}{x}$. Compute $f'(1)$ and $f''(1)$.

3. Sketch the graph of a function $f(x)$ satisfying all of the following conditions :

i) $\lim_{x \to 2} f(x) = f(2) = 3$;

ii) $f'(x) > 0$ for $0 < x \leq 1$;

iii) $f'(0) = 0$;

iv) $\lim_{x \to -2-} f(x) = 0$

4. Find the points on the graph of the function $f(x) = x^4 - 2x^3 + 2x^2$ where the tangent line is horizontal.

5. Below is the graoh of a function $f(x)$. Indicate at which points $f(x)$ is not differentiable.