

1. Find the critical numbers of the function $f(x) = |3x - 4|$.
2. Find the absolute maximum and absolute minimum values of the function $f(x) = 5 + 54x - 2x^3$ on the interval $[0, 4]$.
3. Sketch a graph of a function f that is continuous on $[1, 5]$ and has absolute maximum at $x = 2$, absolute minimum at $x = 3$, and local minimum at $x = 4$.
4. Suppose $3 \leq f'(x) \leq 5$ for all values of x . Show that $18 \leq f(8) - f(2) \leq 30$.
5. Show that the equation $x^4 + 4x + c = 0$ (c is a constant) has at most two real roots.
6. Suppose that f and g are continuous on $[a, b]$ and differentiable on (a, b) . Suppose also that $f(a) = g(a)$ and $f'(x) < g'(x)$ for all $a < x < b$. Prove that $f(b) < g(b)$.