

SECTION 4.1: MAXIMUM & MINIMUM VALUES

1. Sketch a graph $f(x)$ whose domain is the interval $[-1, 4]$ with the following properties:

- (a) f is continuous, has a local minimum at $x = 0$, an absolute minimum at $x = 4$ and an absolute maximum at $x = 2$.
- (b) f has an absolute minimum but no absolute maximum
- (c) f has a critical point at $x = 1$ but no maximum or minimum (of any type) at $x = 1$.

2. Find the absolute maximum and minimum values of $f(x) = x - x^{1/3}$ on the interval $[-1, 4]$. Determine where those absolute maximum and minimum values occur.

3. Find the absolute maximum and minimum values of $f(x) = x + \frac{1}{x}$ on the interval $[1/5, 4]$. Determine where those absolute maximum and minimum values occur.

4. Find the absolute maximum and minimum values of $f(x) = x^{2/3}$ on the interval $[-8, 8]$. Determine where those absolute maximum and minimum values occur.