1. (2 pts) Find all critical point(s) of $f(x) = x^{5/2} - x^{3/2} - x^{1/2}$.

2. (3 pts) Find the absolute maximum and absolute minimum of $f(x) = x^3 - 2x^2 - 4x + 4$ on the interval $[0, 3]$.

3. (3 pts) Find all local minimum(s) and local maximum(s) of $f(x) = \frac{1}{2} x^4 + \frac{2}{3} x^3 - 12x^2 + 7$.

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4. (3 pts) Determine the intervals where \( f(x) = \frac{1}{x^2 - 2x - 8} \) is increasing and where \( f \) is decreasing.

5. (3 pts) Determine the intervals where

\[
f(x) = 2 \sin x - \frac{\sqrt{3}}{2} x^2, \quad 0 \leq x \leq 2\pi
\]

is concave up and where \( f \) is concave down.
6. (4 pts) Sketch the graph of the function $f$ that satisfies the given conditions:

$f'(1) = f(1) = 0 \quad \lim_{x \to -3} f(x) = -\infty \quad \lim_{x \to -1^+} f(x) = -\infty$

$\lim_{x \to -\infty} f(x) = 4 \quad \lim_{x \to -\infty} f(x) = -2$

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

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

$f''(x) > 0$ for $x < -1$

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