MA 16010 Quiz 7

Simplify your final answer. Show all relevant work for each problem. Little to no work, even with a correct answer, will receive little to no credit.

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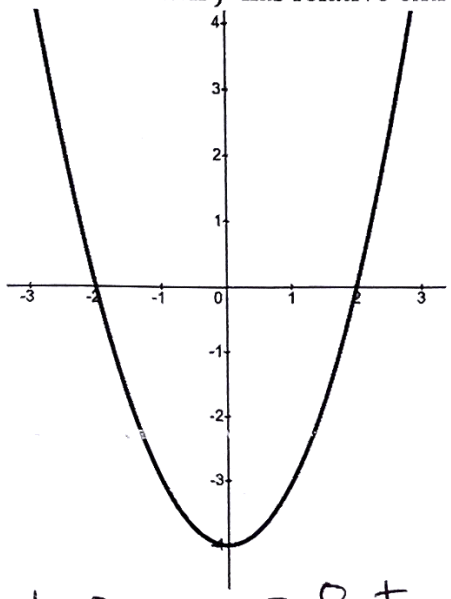
1. The graph of $f'(x)$ is given below. Use the graph to find the critical numbers for $f(x)$, the intervals on which f is increasing, decreasing, concave up, concave down, the x-values at which f has relative extrema, and the x-values at which f has inflection points.



$f'(x)$: $+ \; 0 \; - \; - \; - \; 0 \; +$ (at -2 and 2)

$f''(x)$: $- \; - \; - \; 0 \; + \; + \; +$ (at 0)

Critical #s: $x = -2, \; x = 2$

Inc: $(-\infty, -2), \; (2, \infty)$

Dec: $(-2, 2)$

Max: at $x = -2$

Min: at $x = 2$

CU: $(0, \infty)$

CD: $(-\infty, 0)$

I.P. at $x = 0$.

2. Compute the limit: $\lim_{x\to\infty} \frac{1+2x^3-3x^5}{9x^5+2x}$.

$$= \lim_{x\to\infty} \frac{-3x^5}{9x^5} = \lim_{x\to\infty} -\frac{1}{3} = \boxed{\frac{-1}{3}}$$