

YOUR NAME: _____

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Read each problem **very carefully** before starting to solve it. Each problem is worth 5 points. It is necessary to show **all** your work. Correct answers without explanations are worth 0 points. GOOD LUCK!!

1. Create the sign table for the first and second derivatives of the function

$$f(x) = x^4 - 8x^3 + 18x^2 + 2$$

and roughly sketch its graph. Please, show clearly on the last line of the table the intervals of monotonicity, the intervals of concavity, the local min/max points (and their values) and the inflection points. Moreover, make sure to label all those points clearly on your graphs.

2. Consider the function

$$f(x) = \frac{4x - 8}{x + 2}.$$

Answer the following question carefully. (Do not do any additional work.)

(a) Find the domain $\text{Dom}(f)$ of f .

(b) Find the vertical asymptote(s).

(c) Find the horizontal asymptote of f . Show all details.

(d) Compute a sign table for the first derivative f' of f and find the intervals where f is increasing/decreasing and the local max/min points of f . (Please, do **not** sketch the graph!)