

Pencils and Erasers Only – No Calculators Needed.

1 Evaluate $\int_1^3 (3x^2 - 10x + 8) dx$

- 2 Sketch a bit of the graph of a function f in an interval where $f'(x) > 0$ and $f''(x)$ changes sign from positive to negative.

3 Let

$$f(x) = x^3 + 9x^2 - 48x + 5.$$

Compute and factor f' and f'' . Use them to locate critical values and inflection points of the graph of f . Use factored f' to find intervals on which f is increasing and intervals on which f is decreasing. Use factored f'' to indicate the concavity of the graph of f . Finally, use the above information sketch a tick-mark-free graph of f with the important points labeled with their coordinates.