

Let $f(x) = x^4 + 6x^3 + 12x^2 + 8x + 1$

1. Find the critical numbers of f . (Hint: One is $x = -2$. This should help with factoring)
(Pro Tip: WolframAlpha can also factor polynomials!)
2. On which intervals is f increasing? decreasing?
3. Use the First Derivative Test to classify each critical numbers as a local min, local max, or neither
4. Find the inflection points of f
5. On which intervals is f concave up? concave down?
6. Use the Second Derivative Test to classify each critical numbers as a local min or local max
7. Sketch a graph of $y = f(x)$, and verify your graph by using technology