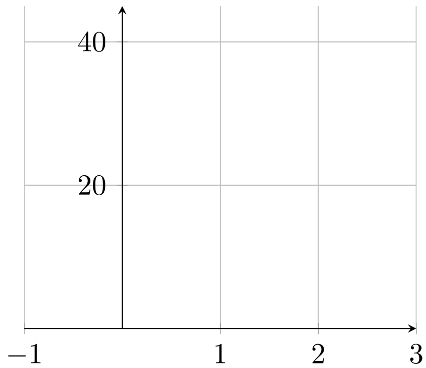
1. Use technology to graph $g(x) = 3x^4 - 16x^3 + 24x^2 + 6$.

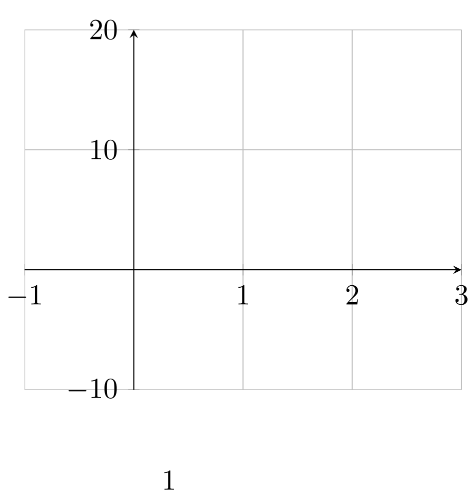


   (a) Looking at the graph, where does it appear that $g(x)$ has relative minima and relative maxima (valleys and peaks)?

   (b) Looking at the graph, where does it appear that $g(x)$ has inflection points?

   (c) Calculate $g'(x)$ and find where it is zero using algebra.

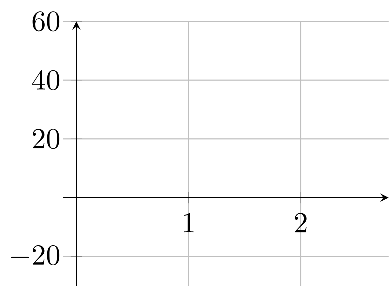
   (d) Use technology to graph $g'(x)$, and check that you correctly found its zeroes.



(e) Now interpret the graph of $g'(x)$, explaining how it can be used to determine where $g(x)$ (the original function) has its relative minima and maxima.

(f) Calculate $g''(x)$ and find its zeroes.

(g) Use technology to graph $g''(x)$, and check that you correctly found its zeroes.

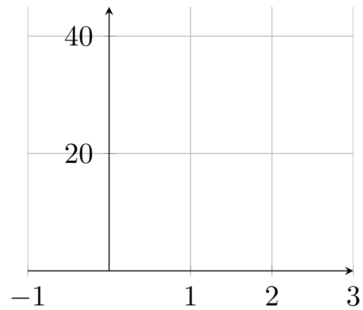


(h) Explain how you can use the graph of $g''(x)$ to determine the exact location of the inflection points of $g(x)$.

(i) Explain how you can use the graph of $g'(x)$ to determine the exact location of the inflection points of $g(x)$.

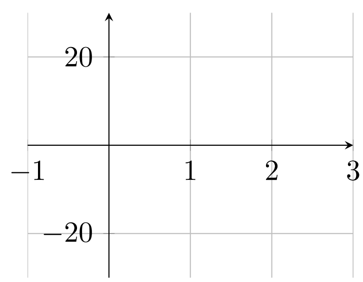
2. Now consider the function $f(x) = 3x^4 - 16x^3 + 23x^2 + 6$. Notice how similar its formula is to the function is in the previous problem.

   (a) Compare its graph (using technology) to the graph of the previous function.

   (b) Looking at the graph, where does it appear that $f(x)$ has relative minima and relative maxima?

   (c) Calculate $f'(x)$ and use technology to graph it.

   (d) Use the graph of $f'(x)$ to answer the question of where $f(x)$ has its relative maxima and minima. Explain.

   (e) What are the key differences between the graphs of $g(x)$ (from problem 1) and $f(x)$ (from this problem)? How are these differences reflected in the graphs of $f'(x)$ and $g'(x)$?