

A-APR Graphing from Factors III

Task

Mike is trying to sketch a graph of the polynomial

$$f(x) = x^3 + 4x^2 + x - 6.$$

He notices that the coefficients of $f(x)$ add up to zero ($1 + 4 + 1 - 6 = 0$) and says

This means that 1 is a root of $f(x)$, and I can use this to help factor $f(x)$ and produce the graph.

- Is Mike right that 1 is a root of $f(x)$? Explain his reasoning.
- Find all roots of $f(x)$.
- Find all inputs x for which $f(x) < 0$.
- Use the information you have gathered to sketch a rough graph of f .



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