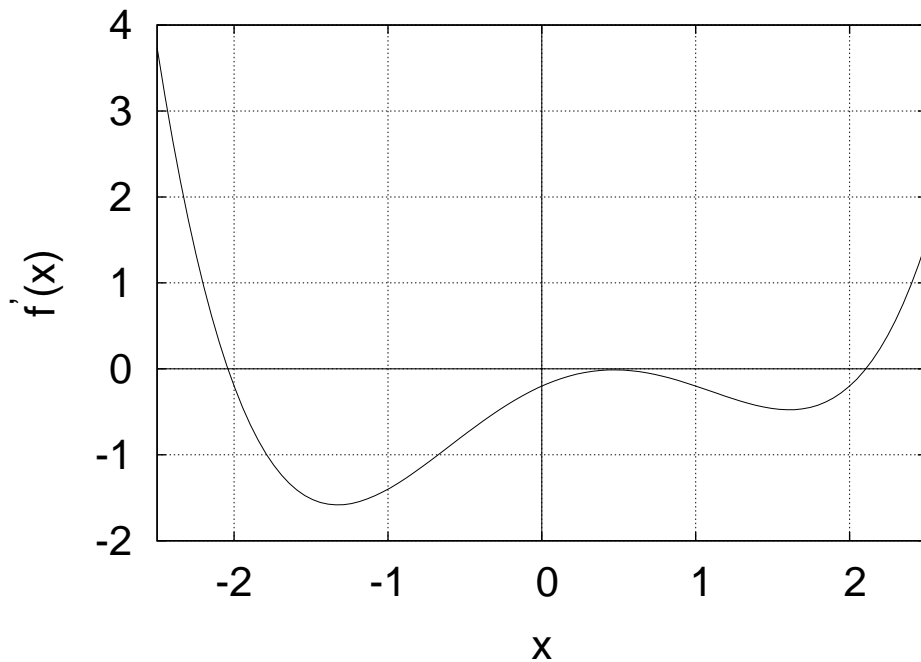


# Chapter 4.1: Using First and Second Derivatives

## Calculus I

College of the Atlantic. October 27, 2022

1. Consider the function  $f(x) = -x^2 + 6x - 5$ .
  - (a) Find and classify all critical points. Determine any local maxima or minima ( $x$  and  $y$  values).
  - (b) Find all inflection points.
  - (c) Sketch the function.
2. In the figure is show a plot of a function's derivative. Find and classify all critical points. Find any inflection points. Sketch  $f(x)$ .



3. Consider the function  $h(x) = x + \sin(x)$ .
  - (a) Find and classify all critical points. Determine any local maxima or minima ( $x$  and  $y$  values).
  - (b) Find all inflection points.
  - (c) Sketch the function.
4. Consider the function  $g(x) = xe^x$ .
  - (a) Find and classify all critical points. Determine any local maxima or minima ( $x$  and  $y$  values).
  - (b) Find all inflection points.
  - (c) Sketch the function.