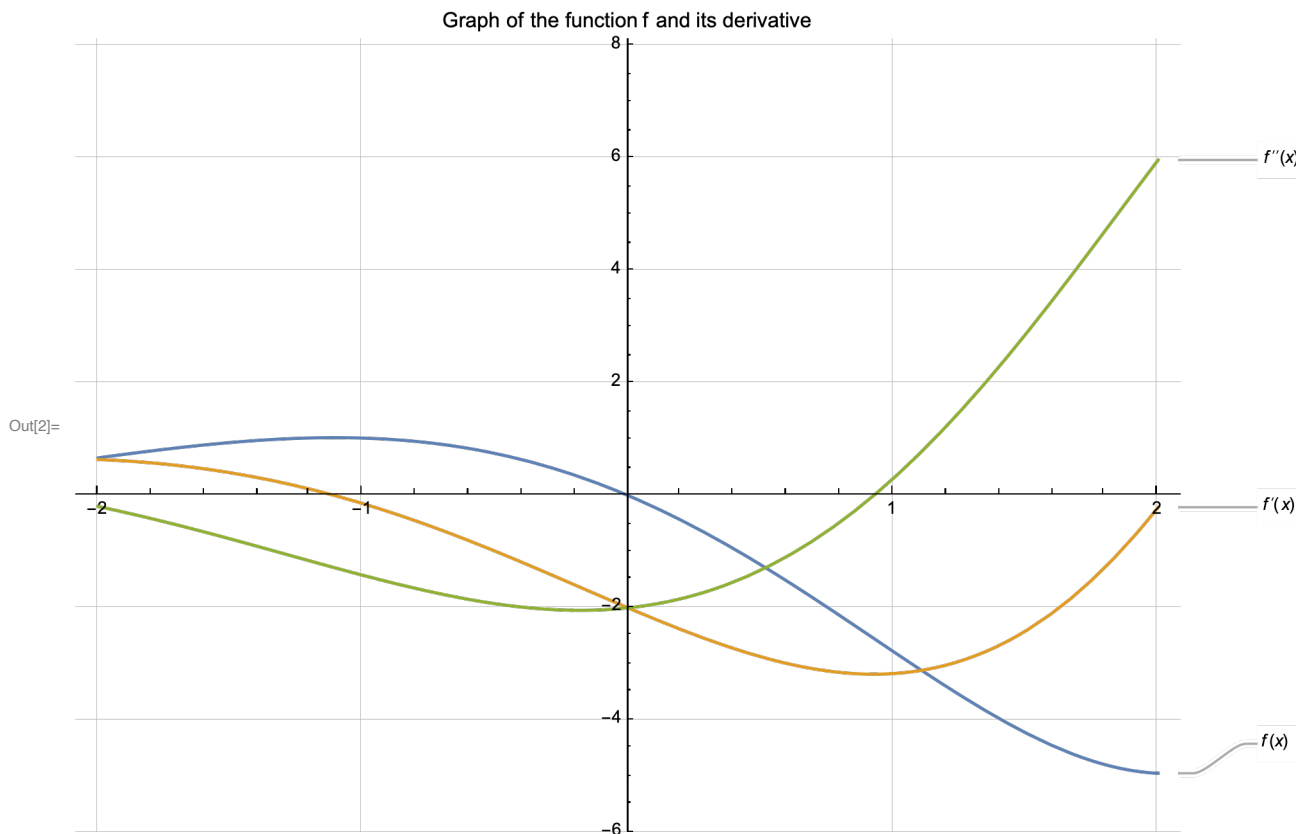# MAT128, Quiz 4 -- Spring, 2024

Name:

1. (4 pts) Below is a plot of f and f' (which is which? Label them appropriately). Carefully add the second derivative function f''(x) to the graph, using estimates from slopes of tangent lines.

Graph of the function f and its derivative

Relate zeros of the derivative and second derivative to features of f.

2. (a) (3 pts) Consider the function $f(x) = 1 - 4x + x^3$. Its derivative is $f'(x) = -4 + 3x^2$. Below you see their graphs. Use the limit definition to find an algebraic expression for the second derivative function f''(x).

Out[5]= $1 - 4x + x^3$

Out[6]=

Graph of the function f(x)
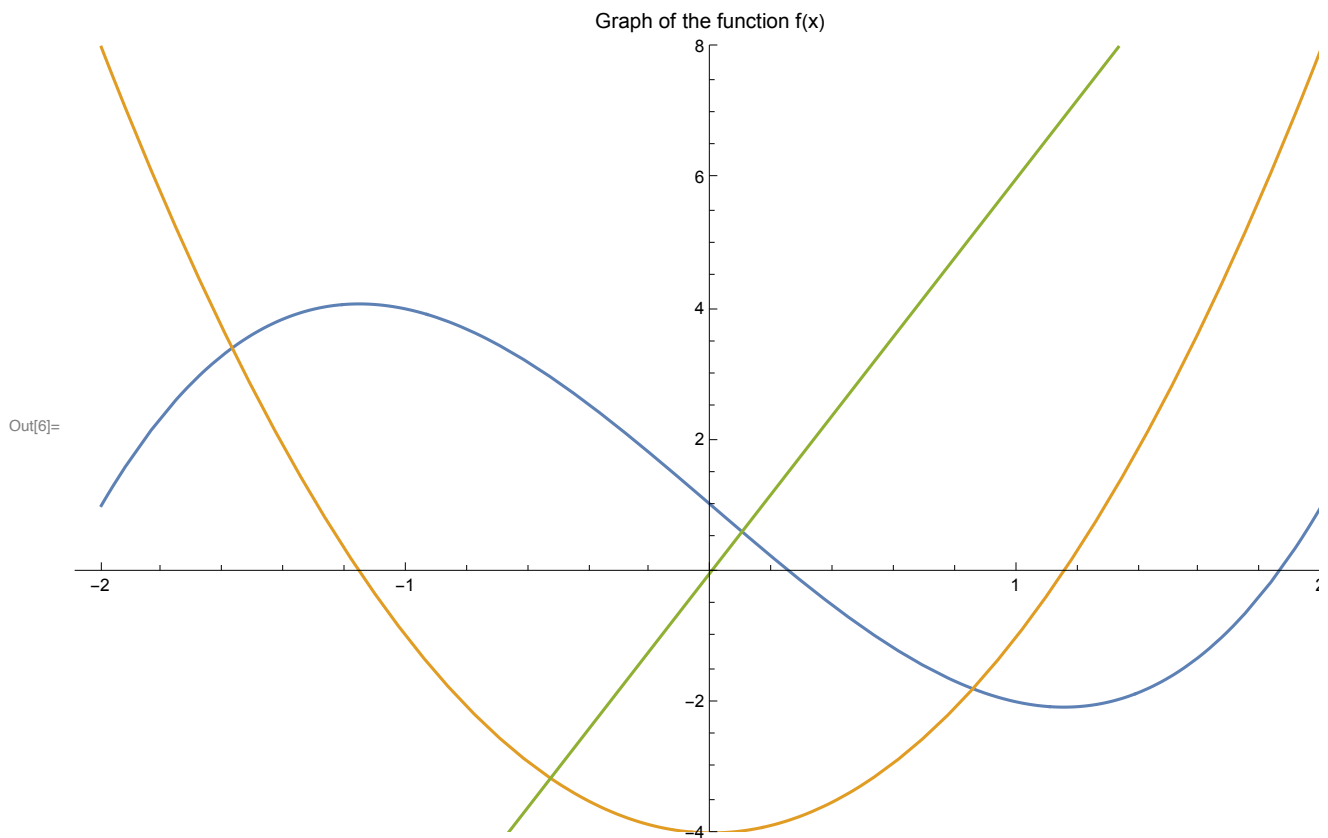
2. (b) (3 pts) Add the graphs of f'(x) and f''(x) onto the graph above, and explain why the derivatives make sense -- how do they relate to the behavior of f?