MTH 261, Quiz #5, Spring 2024 Name _____

Instructions: You must show all work to receive full credit for the problems below. You may check your work with a calculator, but answers without work will receive minimal credit. Use exact answers unless the problem starts with decimals or you are specifically asked to round.

1. Find the first partial derivatives of $f(x, y) = x^4y^5 - 2x^2y^3$.

2. Find f_{xx} and f_{xy} for the function $f(x, y) = 6xy - x^2 - y^4$.

3. Use the first and second derivative tests to determine the critical points and whether they are a maximum, minimum or cannot be determined for the function $f(x) = x^3 - 6x^2 + 12x - 6$. Include sign charts for both first and second derivatives in your analysis.