

Full Name: \_\_\_\_\_

1. Consider the function

$$f(x, y) = y^4 - 4y - x^4 + 2x^2$$

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Find and classify all the stationary critical points of  $f(x, y)$ .

2. Use Lagrange multipliers to find the maximum and minimum value of the function

$$f(x, y, z) = 2x^2 + 3xy + 2y^2 + z^2$$

on the ellipsoid

$$2x^2 + 2y^2 + z^2 = 1.$$