

First midterm test, 15th March 2024

Name: _____

Points: /25

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1. Find the maximum and the minimum of

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

on a rectangle

$$M = \{(x, y) \in \mathbb{R}^2, -1 \leq x \leq 1, -1 \leq y \leq 1\}.$$

Points: /12

2. Find the maximum and the minimum of $f(x, y) = x + y^2$ subjected to the constraint

$$x^2 + y^2 = 4.$$

Points: /8

3. Compute

$$\int \left(2x + \frac{1}{x}\right)^2 \sqrt{x} \, dx.$$

Points: /5

First midterm test, 15th March 2024

Name:

Points: /25

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1. Find the maximum and the minimum of

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

on a rectangle

$$M = \{(x, y) \in \mathbb{R}^2, -1 \leq x \leq 1, -1 \leq y \leq 1\}.$$

Points: /12

2. Find the maximum and the minimum of

$$f(x, y) = 81x^2 + y^2$$

on the ellipse

$$4x^2 + y^2 = 9.$$

Points: /8

3. Compute

$$\int \frac{x^3 + x + 1}{x^2 + 1} dx.$$

Points: /5