

Math 2471 Calc 3 - Homework #5

Pg. 946-7, #9, 21, 22, 39 and 43

Pg. 976-7, #11, 15, 19, 21, 61, 63 and 65.

Pg. 946 Find all relative extrema and saddle points of the following. Use the second derivative test where applicable

$$\#9 \quad f(x, y) = x^2 + y^2 + 8x - 12y - 3$$

$$\#21 \quad f(x, y) = x^2 - xy - y^2 - 3x - y$$

$$\#22 \quad f(x, y) = 2xy - \frac{1}{2}(x^4 + y^4) + 1$$

Pg. 947 Find the absolute extrema of the following functions over the given region

$$\#39 \quad f(x, y) = x^2 - 4xy + 5, \quad D = \{(x, y) \mid 1 \leq x \leq 4, 0 \leq y \leq 2\}$$

$$\#43 \quad f(x, y) = 3x^2 + 2y^2 - 4y, \quad D = \{(x, y) \mid x^2 \leq y \leq 4\}$$

Pg. 976 Evaluate the following iterated integrals

$$\#11 \quad \int_0^1 \int_0^2 (x + y) \, dy \, dx$$

$$\#15 \quad \int_0^1 \int_0^{6x^2} x^3 \, dy \, dx$$

$$\#19 \quad \int_0^1 \int_0^x \sqrt{1 - x^2} \, dy \, dx$$

$$\#21 \quad \int_0^1 \int_0^{\sqrt{1-y^2}} (x + y) \, dx \, dy$$

Pg. 977 In the following, sketch the region of integration, change the order of integration and integrate

$$\#61 \quad \int_0^2 \int_x^2 \sqrt{1 + y^2} \, dy \, dx$$

$$\#63 \quad \int_0^1 \int_{2x}^2 4e^{y^2} \, dy \, dx$$

$$\#65 \quad \int_0^1 \int_y^1 \sin x^2 \, dx \, dy$$

Due: Fri. June 26, 2020.