Math 2513 – Summer 2024

Assignment 3

Due: June 26, 2024 – 11:59PM

Q1 (3) – Let $f(x, y) = 12 \, x\text{^}2 \, y\text{^}3$. Evaluate

(a) $\int_0^3 f(x,y)dx$

(b) $\int_0^2 f(x,y)dy$

(c) $\int_0^2 \int_0^3 f(x,y)dx\,dy$

Q2 (3) – Convert the following vectors to polar coordinates

(a) [1,1]

(b) [3,-4]

(c) [-2,0]

Q3 (3) – Convert the following to Cartesian coordinates

(a) [4, 0]

(b) [2, π]

(c) [1.3, π/2]

Q4 (3) – Using a double integral, find the total mass for a bar that has a density function given by f(x,y) = xy. The bar is 3 units wide and 12 units long.

Q5 (3) – Use the method of Lagrange Multipliers to find the maximum and minimum values of

f(x,y) = xy

subject to the constraint

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