

# Math 2513 – Summer 2024

## Assignment 4

Due: July 10, 2024 – 11:59PM

Q1 (3) – Let  $f(x, y, z) = 12x^2y^3$ . Evaluate

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

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

(c)  $\int_0^1 \int_0^2 \int_0^3 f(x, y, z) dx dy dz$

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

(a)  $[1, 1, -4]$

(b)  $[3, -4, 1.2]$

(c)  $[-2, 0, 9]$

Q3 (3) – Integrate the equation  $g(x, y, z) = x^2 + 4y^2$  over the cylinder of height 8 and radius 2.

Q4 (1) – what is the volume element in spherical coordinates? What is the volume of a sphere of radius A?