

# Math 2513 – Summer 2024

## Assignment 2

Due: June 5, 2024 – 11:59PM

Q1 – Approximate the value of  $0.9^4/5.01^3$  without using a computer or calculator.

Q2 – Find an approximate value for  $\sin(91.1^\circ)$  without using a computer or calculator.

Q3 – Find the gradient of the function  $f(x,y) = e^{xy}\sin(x+y)$

Q4 – Given the function  $f(x,y,z) = 2x^3 + 5yz$ , find the first derivatives with respect to  $r$ ,  $\theta$ ,  $\phi$ , using spherical coordinates.

Q5 – Find the third order Taylor polynomial for the function  $f(x,y) = 5x^2 + e^y$  about the point  $(0,0)$ .

Q6 – Find the directional derivative for  $f(x,y) = 3x^2 - 12y$ , at the point  $(4, 5)$  in the direction of the vector  $[-1,-1]$ .