# Math 2513 – Summer 2024

# Quiz 4

Name:                                                                                          Student ID:


1 – There is a spinning cylinder of compressible fluid. Gravity is giving a density gradient of f(z)=(1-z). Since it is spinning, there is also a density gradient of g(r)=r. The height is 4, and the radius is 1.5. What is the total mass? (3)

2 – Choose the correct answer. (1.5)

    i.  The volume element in cylindrical coordinates is

        a.  dxdydz

        b.  drdθdz

        c.  rdrdθdz

    ii.  The volume of a cylinder is given by

        d.  $2\pi rh$

        e.  $\pi r^2 h$

        f.  $4/3\ \pi r^3$

    iii.  For a function, $f(x,y)$, the approximation $f(x_0,y_0)$ is called the _____ approximation:

        g.  linear

        h.  constant

        i.  second order

3 – If we have the equation, $f(x,y) = 2x – 4y$, does the point (1, 2, -6) sit on it? What about the point (-1, 5, 42)? (1.5)