Math 241 - Quiz 4- Tuesday, November 1

Your name here:

1. Let D be the region in the plane bounded by $x \geq 0$, $y \geq 0$, and the ellipse $4x^2 + y^2 = 4$ and let R be the solid lying above D and below the graph of the function $f(x, y) = x + 2y$.

   (a) Set up, but do not evaluate, the two double integrals in rectangular coordinates that calculate the volume of R. (3 points)

   $dx\,dy$

   $dy\,dx$

   (b) Set up, but do not evaluate, an integral in polar coordinates that calculates the volume of R. (2 points)

   $dr\,d\theta$

2. Let D be the region in the plane bounded below by the x-axis and above by the circle $x^2 + y^2 = 1$. Convert the double integral $\iint_D x + 2\ dA$ into polar coordinates and evaluate the double integral. (3 points)

   $dr\,d\theta =$

(**OVER**)

3. Rewrite the given triple integral in the two other specified orders:

$$\int_0^1 \int_{\sqrt{x}}^1 \int_0^{1-y} f(x,y,z)\, dz\, dy\, dx.$$

(2 points)

$dx\, dy\, dz$

$dz\, dx\, dy$