

2. R is the region bounded by the planes $y = 0$, $z = 0$ and $x + y = 2$ and the cylinder $y^2 + z^2 = 1$ in the first octant.

(10) (a) Sketch the region R .

(10) (b) Find the value of $\iiint_R z \, dV$.

- (20) 3. Use polar coordinates to evaluate

$$\int_0^3 \int_{-\sqrt{9-x^2}}^{\sqrt{9-x^2}} (x^3 + xy^2) dy dx$$

(20) 4. Rewrite the integral

$$\int_{-1}^1 \int_{x^2}^1 \int_0^{1-y} f(x, y, z) dz dy dx$$

as an iterated integral in the order $dx dy dz$

- (20) 5. Use the transformation $x = u^2$, $y = v^2$, $z = w^2$ to find the volume of the region bounded by the surface $\sqrt{x} + \sqrt{y} + \sqrt{z} = 1$ and the coordinate planes.