

[20] 1. Consider

$$\int_0^4 \int_{y/2}^2 e^{x^2} dx dy$$

a) Draw the region in the  $x - y$ -plane.

b) Change the order of integration.

c) Evaluate.

[20] 2. Evaluate.

$$\int_{-\sqrt{3}}^{\sqrt{3}} \int_1^{\sqrt{4-x^2}} \frac{dydx}{(x^2 + y^2)^{3/2}}$$

a) Draw the region.

b) Set up the integral in polar coordinates.

c) Evaluate.

[20] 3. Evaluate  $\int \int_{\mathcal{B}} \int dV$  where  $\mathcal{B}$  is bounded by  $0 \leq z \leq 4 - x^2 - y^2$  and  $x \leq 0, y \geq 0, x + y = 2$ .

[20] 4. Evaluate

$$\iiint_{\mathcal{B}} \frac{dV}{x^2 + y^2 + z^2}$$

where  $\mathcal{B}$  is bounded by  $z \geq 1$  and  $x^2 + y^2 + z^2 = 2z$ .

[20] 5. Evaluate.

$$\int_{-2}^2 \int_0^{\sqrt{4-x^2}} \int_0^{4-x^2-y^2} y dz dy dx$$