



1. Evaluate  $\int_0^{2a} \int_0^{\sqrt{2ax-x^2}} (x^2 + y^2) dx dy$

2. Evaluate  $\iint_R xy(x+y) dx dy$ , where R is the region bounded by the curve

$$y = x^2 \text{ and } y = x.$$

3.

$\iint (x^2 + y^2) x dx dy$  over the positive quadrant of the circle  $x^2 + y^2 = a^2$  by changing to polar coordinates.

Ans.  $\frac{a^2}{5}$

4. Evaluate the following integrals by converting them into polar coordinate  $\iint_D xy dA$ , D is the portion of the region between the circles of radius 2 and radius 5 centred at the origin that lies in the first quadrant.

5. Find the volume of the ellipsoid  $\frac{x^2}{a^2} + \frac{y^2}{b^2} + \frac{z^2}{c^2} = 1$  by using triple integration.

6. Change the order of integration in the double integral and then evaluate :

$$\int_0^{2a} \int_{\sqrt{2ax-x^2}}^{\sqrt{2ax}} dy dx$$