

$$\int_0^3 \int_1^2 xy(1+x+y) dx dy$$

Sol $\rightarrow \int_0^3 \left[\int_1^2 y(1+x+y) dy \right] x dx$

$$\int_0^3 \left[\left(\frac{y^2}{2} \right)_1^2 + x \left(\frac{y^2}{2} \right)_1^2 + \left(\frac{y^3}{3} \right)_1^2 \right] x dx$$

$$\int_0^3 \left[\frac{1}{2} (2^2 - 1^2) + \frac{x}{2} (2^2 - 1^2) + \frac{1}{3} (2^3 - 1^3) \right] x dx$$

$$\int_0^3 \left[\frac{1}{2} (3) + \frac{x}{2} (3) + \frac{1}{3} (7) \right] x dx$$

$$\frac{3}{2} \int_0^3 x dx + \frac{3}{2} \int_0^3 x^2 dx + \frac{7}{3} \int_0^3 x dx$$



PAGE No

DATE: / 201

$$\frac{3}{2} \times \left[\frac{x^2}{2} \right]_0^3 + \frac{3}{2} \left[\frac{x^3}{3} \right]_0^3 + \frac{7}{3} \left[\frac{x^2}{2} \right]_0^3$$

$$\frac{3}{4} [3^2 - 0^2] + \frac{\cancel{3}}{\cancel{2} \times 3} [3^3 - 0^3] + \frac{7}{6} [3^2 - 0^2]$$

$$\frac{27}{4} + \frac{27}{2} + \frac{7 \times 9}{62}$$

$$27 + 27 + 21$$

Formula

$$\int x^n dx = \frac{x^{n+1}}{n+1}$$