$3 \quad \int x^{3/2}$

Page :
Date: / /

$$\int_0^1 \int_x^{x^{1/2}} (x^2+y^2)\,dx\,dy$$

$x \quad y$

$$\Rightarrow \int_0^1 \left[\int_x^{x^{1/2}} (x^2+y^2)\,dy\right] dx$$

$$\Rightarrow \int_0^1 \left| xy + \frac{y^3}{3} \right|_x^{x^{1/2}} dx$$

$$\Rightarrow \int_0^1 \left[x \cdot x^{1/2} + \frac{x^{3 \times 1/2}}{3} \right] dx$$

$$\Rightarrow \int_0^1 \left(x^{3/2} + \frac{x^{3/2}}{3} \right) dx$$

$$\Rightarrow \int_0^1 \left(x^{3/2} + \frac{x^{3/2}}{3} \right) dx$$

$$\Rightarrow \left| \frac{x^{3/2+1}}{3/2+1} + \frac{x^{3/2+1}}{3(3/2+1)} \right|_0^1$$

$$\left| \frac{x^{5/2}}{5/2} + \frac{x^{5/2}}{3 \times \frac{5}{2}} \right|_0^1 =$$

$$\Rightarrow \frac{(1)^{5/2}}{5/2} + \frac{(1)^{5/2}}{15/2}$$

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8

c) $\frac{1}{5/2} + \frac{1}{15/2}$

c) $\frac{8}{15}$ Ans

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Page :
Date: / /

(1) Properties of double Integration.

(1) $\iint_D [f(x,y) + g(x,y)]\, dA = \iint_D f(x,y)\, dA + \iint_D g(x,y)\, dA$

(2) $\iint_D c\, f(x,y)\, dA = c \iint_D f(x,y)\, dA$

(3) If $f(x,y) \geq g(x,y)$ for all (x,y) in D then

$\iint_D f(x,y)\, dA \geq \iint g(x,y)\, dA$