Practice Examples

1 Evaluate $\displaystyle\int\limits_{0}^{1}\int\limits_{0}^{2}(4-x-y)\,dxdy$. **(Ans: 5)**

2 Evaluate $\displaystyle\int\limits_{0}^{1}\int\limits_{0}^{x}e^{y/x}\,dA$ **(Ans:** $\dfrac{e-1}{2}$**)**

3 Change the order of integration in $\displaystyle\int\limits_{0}^{a}\int\limits_{y}^{a}\dfrac{x}{x^{2}+y^{2}}\,dydx$ and hence evaluate it. **(Ans:** $\dfrac{a\pi}{4}$**)**

4 Evaluate $\displaystyle\iint\limits_{R}r^{3}drd\theta$; where R is the region bounded by the curves $r=2\sin\theta$ and $r=4\sin\theta$.

5 Evaluate $\displaystyle\int\limits_{0}^{2}x^{4}(8-x^{3})^{-1/3}\,dx$. **(Ans:** $\dfrac{16}{3}\beta\left(\dfrac{5}{3},\dfrac{2}{3}\right)$**)**

6 Evaluate $\displaystyle\int\limits_{0}^{\pi/2}\sqrt{\cot x}\,dx$.

7 Find $\displaystyle\int_{0}^{\infty}2^{-3x^{2}}\,dx$.

8 Change the order of integration in $\displaystyle\int_{0}^{1}\int_{0}^{\sqrt{1-x^{2}}}x\,dydx$ and hence evaluate it. **(Ans:** $\dfrac{1}{3}$**)**

9 Find $\displaystyle\int_{0}^{3}\int_{0}^{\sqrt{9-x^{2}}}x^{2}+y^{2}\,dA$ by changing in to polar coordinate system. **(Ans:** $\dfrac{81\pi}{8}$**)**

10 Find the area of a region enclosed by the cardioid $r=1-\cos\theta$.

11 Evaluate $\iiint dv$, where V is the region bounded by $1\le x\le 2, 2\le y\le 4, 2\le z\le 5$. **(Ans: 6)**

12 Evaluate $\int_{1}^{2}\int_{2}^{3}\int_{1}^{0}xyz\,dydzdx$. **(Ans:** $\dfrac{15}{8}$**)**