EKPERIGIN ANITA ONOMLE Dept: MBBS.
Matric No: 19/MHS01/149

LIATE

22/5/20

Assignment

1. $\int 2x^2 \ln x$

$u = \ln x \qquad dv = 2x^2$

$du = \frac{1}{x} dx \qquad v = \frac{2x^3}{3}$

$\int u\,dv = uv - \int v\,du$

$= \ln x \cdot \frac{2x^3}{3} - \int \frac{2x^3}{3} \cdot \frac{1}{x} dx$

$= \frac{2x^3}{3} \ln x - \int \frac{2x^2}{3} dx$

$= \frac{2x^3}{3} \ln x - \frac{2x^3}{9}$

$= \frac{2}{3}x^3 (\ln x - \frac{1}{3}) + c$

2. $\int 3t\, e^{2t}$

$u = 3t \qquad dv = e^{2t}$

$du = 3\,dt \qquad v = \frac{e^{2t}}{2}$

$\int u\,dv = uv - \int v\,du$

$= 3t \cdot \frac{e^{2t}}{2} - \int \frac{e^{2t}}{2} \cdot 3\,dt$

$= \frac{e^{2t}}{2} 3t - \int \frac{e^{2t}}{2} 3\,dt$

$= \frac{3}{2} e^{2t} - \frac{3e^{2t}}{4} + c$

3 $\int x^2 \sin x$

$u = x^2 \quad dv = \sin x$

$du = 2x\,dx \quad v = -\cos x$

$\int u\,dv = uv - \int v\,du$

$= x^2 \cdot -\cos x - \int -\cos x \cdot 2x\,dx$

$= -\cos^3 x^3 - \frac{\sin^3 x^3}{2}$

$= -\cos^3 x^3 - \sin^3 x^3 + C$

4. $\int \cos 5x \cos 6x\,dx$

$\cos A \cos B = \frac{1}{2}[\cos(A+B) + \cos(A-B)]$

$= \frac{1}{2}(\cos 11x + \cos(-x))$

$\int \cos 5x \cos 6x = \frac{1}{2}\int(\cos 11x - \cos x)$

$= \frac{1}{2}\left(\frac{\sin 11x}{11} - \sin x\right)$

$= \frac{\sin 11x}{22} - \frac{\sin x}{2} + C$

5. $\int \sin 7x \cos 2x\,dx$

$\sin A \cos B = \frac{1}{2}(\sin(A+B) + \sin(A-B))$

$\sin 7x \cos 2x = \frac{1}{2}(\sin 9x + \sin 5x$

$\int \sin 7x \cos 2x = \frac{1}{2}\left(-\frac{\cos 9x}{9} - \frac{\cos 5x}{5}\right.$

$= -\frac{\cos 9x}{18} - \frac{\cos 5x}{10} + C$