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DEPT : MECHANICAL ENGINEERING

MATRIC NO : 19/ENG06/018

COURSE CODE: MAT 104

1) 3te^2t . Let u = 3t and dv = e^2t

du/dt = 3(cross multiply) ꓢdv = 3e^2t

du = 3dt v = e^2t/2

Using UV- S vdu = S udv

3t(e^2t/2) - S e^2t/2 × 3dt

3t(e^2t/2) – ½ ꓢ 3e^2t dt

3t(e^2t/2) – ½ × 3e^2t/2 + C

[ 3/2te^2t - 3e^2t/4] + C

2) S x2sin x

Let u = x2 and dv = sin x

du/dx= 2x and v = -cos x

Using UV – S VdU

(x2) ( -cos x) – S (- cos x) ( 2xdx)

-X2 cos x – S – 2x cos x dx

[ let u = -2x and dv = cos x]

[ du/dx = -2x and dv = cos x]

( -2x) ( sin x) – S (sin x ) ( -2)dx

-2x sin x – ( - 2) S sin x dx

-2x sin x – ( -2) – cos x + C

- 2x sin x – 2 cos x + C

S x2 sin x = - x2 cos x – 2x sin x – 2 cos x + C

3) S sin 7x cos 2x

Let A = 7x, B = 2x

S sin 7x cos 2x = ½ [sin ( 7x + 2x ) + sin ( 7x – 2x)]

S sin 7x cos 2x = ½ [ sin 9x + 5x ]

= ½ S [ sin 9x /9 + sin 5x / 5] = - cos 9x /18 – cos 5x/10 + C

4) 2x – 3x2/1 – x = 1 – x √ 2x – 3x2 = - x3

which can now be S ( 2x – x^2 ) dx + S x^3/1-x dx

= 2x^2/2 - x^3/3 + x^3 In (1- x)