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COMPUTER ENGINEERING
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SERIAL NO: 35
MAT 104

1) $(11-3x)$

x^2+2x-3

$$\frac{11-3x}{x^2+2x-3} = \frac{11-3x}{(x-1)(x+3)}$$

$$\frac{11-3x}{(x-1)(x+3)} = \frac{A}{(x-1)} + \frac{B}{(x+3)}$$

$11-3x = A(x+3)+B(x-1)$

let $(x-1)=0$

$x=1$

$11-3(1) = A(1+3)+B(1-1)$

$11-3 = A(4)+B(0)$

$8 = 4A$

$A=2$

let $(x+3)=0$

$x=-3$

$11-3(-3) = A(-3+3)+B(-3-1)$

$11+9 = A(0)+B(-4)$

$20 = -4B$

$B=-5$

$$\frac{11-3x}{(x-1)(x+3)} = \frac{2}{(x-1)} + \frac{-5}{(x+3)} + C$$

$$\int \frac{11-3x}{x^2+2x-3} = \int \frac{2}{(x-1)} - \int \frac{5}{(x+3)} + C$$

$= 2\log_e(x-1) - 5\log_e(x+3) + C$

$= \log_e \frac{(x-1)^2}{(x+3)^5} + C$

② $(2x^2-9x-35)$

$(x+1)(x-2)(x+3)$

$$\frac{2x^2-9x-35}{(x+1)(x-2)(x+3)} = \frac{A}{(x+1)} + \frac{B}{(x-2)} + \frac{C}{(x+3)}$$

$2x^2-9x-35 = A(x-2)(x+3) + B(x+1)(x+3) + C(x+1)(x-2)$

let $(x+1)=0$

$x=-1$

$2(-1)^2-9(-1)-35 = A(-1-2)(-1+3)$

$2+9-35 = A(-3)(2)$

$-24 = A(-6)$

$-24 = -6A$

$A = 4$

let $(x-2)=0$

$x=2$

$2(2)^2-9(2)-35 = B(2+1)(2+3)$

$8-18-35 = B(3)(5)$

$-45 = B(15)$

$-45 = 15B$

$B = -3$

let $(x+3)=0$

$x=-3$

$2(-3)^2-9(-3)-35 = C(-3+1)(-3-2)$

$18+27-35 = C(-2)(-5)$

$10 = C(10)$

$10 = C10$

$C = 1$

$$\frac{2x^2-9x-35}{(x+1)(x-2)(x+3)} = \frac{4}{(x+1)} + \frac{-3}{(x-2)} + \frac{1}{(x+3)}$$

$$\int \frac{2x^2-9x-35}{(x+1)(x-2)(x+3)} = \int \frac{4}{(x+1)} - \int \frac{3}{(x-2)} + \int \frac{1}{(x+3)} + C$$

$$= 4\log_e(x+1) - 3\log_e(x-2) + \log_e(x+3) + C$$

$$= \log_e \frac{(x+1)^4 (x+3)}{(x-2)^3} + C$$

③ $\frac{1}{(x^2+121)}$

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

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

$$= \frac{(x+11)^{-1}}{-1} + C$$

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