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MATRIC NO: 19/MH501/010

DEPT: MBBS

$$1. \int \frac{11-3x}{x^2+2x-3}$$

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

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

when $x = -3$

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

$$11+9 = -4B$$

$$20 = -4B$$

$$B = -5$$

when $x = 1$

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

$$8 = 4A$$

$$A = 2$$

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

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

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

$$2) \int \frac{4x-16}{x^2-2x-3}$$

$$\frac{4x-16}{(x+1)(x-3)} = \frac{A}{(x+1)} + \frac{B}{(x-3)}$$

$$4x-16 = A(x-3) + B(x+1)$$

when $x = 3$

$$4(3)-16 = A(3-3) + B(3+1)$$

$$-4 = 4B$$

$$B = -1$$

when $x = -1$

$$4(-1)-16 = A(-1-3) + B(-1+1)$$

$$-20 = -4A$$

$$A = 5$$

$$\frac{4x-16}{(x+1)(x-3)} = \frac{5}{x+1} - \frac{1}{x-3}$$

$$\int \frac{4x-16}{x^2-2x-3} = \int \frac{5 dx}{x+1} - \int \frac{dx}{x-3}$$

$$\int \frac{4x-16}{x^2-2x-3} = 5 \ln(x+1) - \ln(x-3)$$

$$3.) \int \frac{2x^2-9x-35}{(x+1)(x-2)(x+3)} dx$$

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

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

$$2x^2-9x-35 = A(x^2+x-6) + B(x^2+4x+3) + C(x^2-x-2)$$

$$2x^2-9x-35 = Ax^2 - Ax - 6A + Bx^2 + 4Bx + 3B + Cx^2 - Cx - 2C$$

$$= x^2(A+B+C) + x(A+4B-C) + (-6A+3B-2C)$$

$$A+B+C = 2 \quad \text{--- (i)}$$

$$A+4B-C = -9 \quad \text{--- (ii)}$$

$$-6A+3B-2C = -35 \quad \text{--- (iii)}$$

$$A = 2-B-C \quad \text{--- (iv) put eq. iv in eq. ii and iii}$$

$$2(2-B-C) + 4B - C = -9$$

$$2 + 3B - 2C = -9 \quad \text{--- *}$$

$$-6(2-B-C) + 3B - 2C = -35$$

$$9B + 4C = -23 \quad \text{--- *}$$

$$9B \quad 2B$$

$$3B - 2C = -11 \quad \text{--- (i) } \times 9$$

$$9B + 4C = -23 \quad \text{--- (ii) } \times 3$$

$$27 - 18C = -99$$

$$-18C = -126$$

$$-30C = -30$$

$$-30C = -30$$

$$C = 1$$

$$\text{from } 3B - 2C = -11$$

$$3B - 2 = -11$$

$$\frac{3B}{3} = \frac{-9}{3}$$

$$B = -3$$

$$A = 2 - B - C$$
$$= 2 - (-3) - 1$$

$$= 2 + 3 - 1$$

$$A = 4$$

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

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

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