

4-MAY-2020

NAME
MATRIC
NO
19/MTS01/079

COURSE
MAT 104

DEPT
MBBS ; 100L

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

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

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

$f(1)$

$$11-3(1) = A(4) + B(0)$$

$$8 = 4A$$

$$A = 2$$

$f(-3)$

$$11-3(-3) = A(0) + B(-3-1)$$

$$11+9 = 4B$$

$$20 = 4B$$

$$B = -5$$

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

let $u = (x-1)$

$$\frac{du}{dx} = 1$$

dx

$$\therefore du = dx$$

$$\int \frac{2}{u} du = 2 \int \frac{1}{u} du$$

$$2 \ln u = 2 \ln(x-1)$$

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$$\text{let } u = (x+3)$$

$$\frac{du}{dx} = 1$$

$$dx$$

$$\therefore du = dx$$

$$-\int \frac{5}{u} du$$

$$-5 \int \frac{1}{u} du$$

$$-5 \ln u$$

$$-5 \ln(x+3)$$

$$\therefore \text{Ans; } 2 \ln(x-1) - 5 \ln(x+3)$$

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

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

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

$$f(-1)$$

$$= -4(-1) - 16 = A(-4) + B(0)$$

$$12 - 16 = 4B$$

$$-4 = 4B$$

$$B = -1$$

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

$$= \int \frac{5 dx}{x+1} - \int \frac{1 dx}{x-3}$$

$$\text{let } u = x+1$$

$$\frac{du}{dx} = 1$$

$$dx$$

$$\therefore du = dx$$

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$$\int \frac{5}{u} du$$

$$5 \int \frac{1}{u} du$$

$$5 \ln u = 5 \ln(x+1)$$

$$\text{let } u = x-3$$

$$\frac{du}{dx} = 1$$

$$\therefore du = dx$$

$$-\int \frac{1}{u} du$$

$$-\ln u = -\ln(x-3)$$

$$\therefore \text{Answer} = 5 \ln(x+1) - \ln(x-3)$$

$$Q \int \frac{2x^2 - 9x - 35}{(x+1)(x-2)(x+5)} dx$$

$$= \frac{A}{x+1} + \frac{B}{x-2} + \frac{C}{x+5}$$

$$2x^2 - 9x - 35 = A(x-2)(x+5) + B(x+1)(x+5) + C(x+1)(x-2)$$

for 2;

$$2(2)^2 - 9(2) - 35 = A(2-2)(2+5) + B(2+1)(2+5) + C(2+1)(2-2)$$

$$8 - 18 - 35 = 15B$$

$$B = \frac{-45}{15}$$

$$B = -3$$

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for (-1)

$$2(-1)^2 - 9(-1) - 35 = A(-3)(2) + 6(0)(2) + C(0)(-3)$$

$$2 + 9 - 35 = -6A$$

$$-24 = -6A$$

$$A = \frac{-24}{-6}$$

$$A = 4$$

for (-3)

$$2(-3)^2 - 9(-3) - 35 = A(-5)(0) + B(-2)(0) + C(-2)(-5)$$

$$2(9) + 27 - 35 = 10C$$

$$10 = 10C$$

$$\therefore C = 1$$

$$A = 4, B = -3, C = 1$$

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

$$\int \frac{4}{(x+1)} + \int \frac{-3}{(x-2)} + \int \frac{1}{(x+3)}$$

$$\text{let } u = x+1$$

$$\text{let } u = x-2$$

$$\text{let } u = x+3$$

$$\frac{du}{dx} = 1$$

$$\frac{du}{dx} = 1$$

$$\frac{du}{dx} = 1$$

$$dx$$

$$dx$$

$$dx$$

$$\therefore du = dx$$

$$\therefore du = dx$$

$$\therefore du = dx$$

$$4 \int \frac{1}{u} du$$

$$-3 \int \frac{1}{u} du$$

$$\int \frac{1}{u} du$$

$$4 \ln u$$

$$-3 \ln u$$

$$\ln u$$

$$4 \ln(x+1)$$

$$-3 \ln(x-2)$$

$$\ln(x+3)$$

$$\therefore \text{Answer} = 4 \ln(x+1) - 3 \ln(x-2) + \ln(x+3)$$