

AJIOLE TENIOLA PRECIOUS

19/MH501/069

MBBS

Math 104 ASSIGNMENT

SERIAL NUMBER: 103

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

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

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

f(1)

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

$$8 = 4A$$

$$A = 2$$

f(-3)

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

$$11+9 = -4B$$

$$20 = -4B$$

$$B = -5$$

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

$$= \text{let } u = (x-1)$$

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

dx

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

$$2 \ln|u| = 2 \ln|x-1|$$

$$\text{Ans} = 2 \ln|x-1| - 5 \ln|x+3|$$

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

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

du = dx

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

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

$$-5 \ln|u| = -5 \ln|x+3|$$

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

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

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

for (-1)

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

$$= -4 - 16 = A - 4$$

$$A = 5$$

for (3)

$$= 4(3) - 16 = A(0) + B(4)$$

$$12 - 16 = 4B$$

$$-4 = 4B$$

$$B = -1$$

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

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

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

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

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

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

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

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

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

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

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

$$= -\ln u$$

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

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

$$= \frac{A}{x+1} + \frac{B}{x-2} + \frac{C}{x+3}$$

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

for (2)

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

$$2(4) - 18 - 35 = 15B$$

$$-45 = 15B$$

$$B = \frac{-45}{15} = -3$$

$$B = -3$$

for (-1)

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

$$-24 = -6A$$

$$A = 4$$

for (-3)

$$2(-3)^2 - 9(-3) - 35 = A(-3-2) + B(-3+1)(0) + C(-2)(5)$$

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

$$10 = 10C$$

$$C = 1$$

$$A = 4 \quad B = -3 \quad C = 1$$

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

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

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

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

$$du = dx$$

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

$$4 \ln |u|$$

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

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

$$du = dx$$

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

$$-3 \ln |u|$$

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

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

$$du = dx$$

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

$$\ln |u|$$

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

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

$$\ln(x+3)$$

$$4\ln(x+1) - 3\ln(x-2) + \ln(x+3)$$

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