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Course code: MAT 104

Dept: MBBS.

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

$$x^2 + 2x - 3$$

$$x^2 - 3x - x - 3$$

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

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

$$\int \frac{11 - 3x}{(x-1)(x+3)}$$

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

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

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

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

$$f(1) \Rightarrow 11 - 3(1) = A(1+3) + B(1-1)$$

$$11 - 3 = 4A + 0$$

$$4A = 8$$

$$A = 2$$

$$f(-3) \Rightarrow 11 - 3(-3) = A(-3+3) + B(-3-1)$$

$$11 + 9 = 0 + 4B$$

$$-4B = 20$$

$$B = -5$$

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

$$= 2 \int \frac{1}{x-1} - 5 \int \frac{1}{x+3}$$

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

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

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

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

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

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

$$12 - 16 = 0 + 4B$$

$$4B = -4$$

$$B = -1$$

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

$$-4 - 16 = -4A + 0$$

$$-20 = -4A$$

$$A = 5$$

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

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

$$= 5 \ln(x+1) - \ln(x-3)$$