

DMORGABOVI SATURE FAVORS
19/MH901/344
MEDICINE AND SURGERY

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

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

$$F(-3) \Rightarrow 11-3(-3) = B(-4)$$

$$20 = -4B$$

$$B = -5$$

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

$$8 = 4A$$

$$A = 2$$

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

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

$$\text{Let } U = x+1 \quad \frac{dU}{dx} = 1, \quad dU = dx$$

$$\int \frac{2 dx}{x+1} \Rightarrow \int \frac{2 dU}{U} \Rightarrow 2 \int \frac{1}{U} dU$$

$$= 2 \ln U \Rightarrow 2 \ln(x+1)$$

$$\text{Let } U = x+3; \quad \frac{dU}{dx} = 1; \quad dU = dx$$

$$\int \frac{-5 dx}{x+3} \Rightarrow \int \frac{-5 dU}{U} \Rightarrow -5 \int \frac{1}{U} dU$$

$$= -5 \ln U \rightarrow -5 \ln(x+3)$$

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

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

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

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

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

$$-4 = 4B$$

$$B = -1$$

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

$$-20 = -4A$$

$$A = 5$$

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

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

Let $U = x+1$ $\frac{dU}{dx} = 1$; $dU = dx$

$$\int \frac{5 dx}{(x+1)} \Rightarrow \int \frac{5 dU}{U} \rightarrow 5 \int \frac{1}{U} dU \Rightarrow 5 \ln U$$

$$\Rightarrow 5 \ln(x+1)$$

Let $U = x-3$ $\frac{dU}{dx} = 1$; $dU = dx$

$$\int \frac{-1 dx}{(x-3)} \Rightarrow \int \frac{-1 dU}{U} \Rightarrow -1 \int \frac{1}{U} dU \Rightarrow -1 \ln U$$

$$\Rightarrow -1 \ln(x-3)$$

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

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

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

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

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

$$-24 = -6A$$

$$A = 4$$

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

$$-45 = 15B$$

$$B = -3$$

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

$$10 = 10C$$

$$C = 1$$

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

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

$$\begin{aligned} \text{Let } U &= x+1 \quad \frac{dU}{dx} = 1 \quad dU = dx \\ \int \frac{4 dx}{(x+1)} &= 4 \int \frac{dU}{U} = 4 \ln U \\ &= 4 \ln(x+1) \end{aligned}$$

$$\begin{aligned} \text{Let } U &= x-2; \quad \frac{dU}{dx} = 1; \quad dU = dx \\ \int \frac{-3 dx}{(x-2)} &= -3 \int \frac{1 dU}{U} = -3 \ln U \end{aligned}$$

$$\begin{aligned} \text{Let } U &= x+3; \quad \frac{dU}{dx} = 1; \quad dU = dx \\ \int \frac{1 dx}{(x+3)} &= \int \frac{1 dU}{U} = \ln U \\ &= \ln(x+3) \end{aligned}$$

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