

Oluwole-010 Oluwagbemi

14/MH501/3+2

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

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

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

$$f(1) \Rightarrow 11-3(1) = A(1+3) + B(1-1)$$
$$8 = 4A$$
$$A = 2$$

$$f(-3) \Rightarrow 11-3(-3) = B(-3-1)$$
$$= 11+9 = B(-4)$$
$$20 = B(-4)$$
$$B = -5$$

$$\Rightarrow \int \frac{2}{(x-1)} dx + \int \frac{-5}{x+3} dx \quad \therefore A=2, B=-5$$

$$u=x-1 \quad \frac{du}{dx} = 1 \quad | \quad v=x+3 \quad \frac{dv}{dx} = 1$$

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

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

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

$$= \int \frac{-5}{v} \cdot \frac{dv}{1}$$

$$= 2 \ln u$$

$$= -5 \ln v$$

$$= 2 \ln u - 5 \ln v$$

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

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

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

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

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

$$-20 = -4A$$

$$A = 5$$

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

$$-4 = 4B$$

$$B = -1 \quad \therefore A = 5 \quad B = -$$

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

$$u = (x+1) \frac{du}{dx} = 1 \quad \left| \quad u = (x-3) \frac{du}{dx} = 1 \right.$$

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

$$= 5 \ln u$$

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

$$= -\ln u$$

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