

Name: Asita Asueiyenoboniso
Department: Computer Science
Matric Number: 19/sci01/024

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

$$x^2+2x-3 = (x-1)(x+3)$$

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

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

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

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

$$11-3x = Ax + 3A + Bx - B = A + Bx - B = A$$

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

$$11-3x = -3 = A+B$$

$$-3 \Rightarrow \text{The constant } 0 = 3A - B$$

$$\therefore A = -B$$

$$-3 = -B + B$$

$$-3 = 2B$$

$$\therefore B = \frac{-9}{2}$$

$$-3 = A - \frac{9}{2}$$

$$-3 = 2A - 9$$

$$9-6 = 2A$$

$$A = \frac{3}{2}$$

$$\therefore \frac{11-3x}{(x-1)(x+3)} = \frac{3}{2(x-1)} + \frac{-9}{2(x+3)}$$

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

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

$$11-3x = Ax + 3A + Bx - B = (A+B)x + (3A-B)$$

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

$$-3 = A+B$$

$$-3 = -3A - B$$

$$\therefore -A = -B$$

$$-3 = \frac{-B}{3} + B$$

$$-3 = \frac{2B}{3}$$

$$\therefore B = \frac{-9}{2}$$

$$-3 = A - \frac{9}{2}$$

$$-3 = 2A - 9$$

$$-6 = 2A - 9$$

$$9-6 = 2A$$

$$A = \frac{3}{2}$$

$$\therefore \frac{11-3x}{(x-1)(x+3)} = \frac{3}{2(x-1)} + \frac{-9}{2(x+3)}$$

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

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

$$2x^2 - 9x - 35 = A(x^2 + x - 6) + B(x^2 + 4x + 3) + C(x^2 - x - 2)$$

$$2x^2 - 9x - 35 = Ax^2 + Ax - 6A + Bx^2 + 4Bx + 3B + Cx^2 - Cx - 2C$$

$$2x^2 - 9x - 35 = (A+B+C)x^2 + (A+4B-C)x + (-6A+3B-2C)$$

$$2x^2 - 9x - 35 = (A+B+C)x^2 + (A+4B-C)x + (-6A+3B-2C)$$

$$2 = A+B+C$$

The constants = $0 = (A+4B-C)$ and $0 = (-6A+3B-2C)$

$$A+4B-C = -6A+3B-2C$$

$$7A + 3B - 2C = 0$$

$$7A + 3B - 2C = 0$$

$$A = -\frac{3}{7}B + \frac{2}{7}C$$

$$B = -\frac{1}{4}A + C$$

$$B = -\frac{1}{4}\left(-\frac{3}{7}B + \frac{2}{7}C\right) + C$$

$$B = \frac{3}{28}B - \frac{2}{28}C + C$$

B

$$\begin{aligned} 3 \int \frac{-1}{(x^2+12)} dx &= \int \frac{1}{(x^2+11^2)} dx \\ &= \frac{1}{22} \ln \left\{ \frac{x-11}{x+11} \right\} + C \end{aligned}$$