

Name: Rotomi Duanocorwini Gads Janday  
 Matic no: 19101101887  
 Dept: mBS/mHS  
 Course: MKT COP

### Assignment

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

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

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

Divide through by  $(x-1)(x+3)$

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

$$\text{When } x = -3$$

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

$$11+9 = -4B$$

$$20 = -4B$$

$$B = -5$$

$$\text{When } x = 1, 1-3(1) + A(1+3) + B(1-1)$$

$$8 = 4A$$

$$A = 2$$

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

$$\frac{x^2 - 8x}{x^2 + 2x - 3} dx = 2 \ln|x-1| - 3 \ln|x+3| + C$$

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

$$\frac{4x-16}{x^2-2x-3} = \frac{A}{x-3} + \frac{B}{x+1}$$

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

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

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

$$\text{column } x = -1$$

$$4(-1) - 16 = A(0) + B(-1-3)$$

$$-20 = -4B$$

$$B = 5$$

$$\text{column } x = 3$$

$$4(3) - 16 = A(3+1) + B(0)$$

$$-4 = 4A$$

$$A = -1$$

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

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

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

$$du = dx$$

$$du = dx$$

$$du = dx$$

$$du = dx$$



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

$$\int \frac{4x-16}{x^2-2x-8} dx = \ln |x-8| + 5 \ln |x+1| + C$$

$$\int \frac{4x-16}{x^2-2x-8} dx = 5 \ln |x+1| - \ln |x-8| + C$$

$$3 \int \frac{2x^2+9x-85}{(x+1)(x-2)(x+3)} dx$$

$$\frac{2x^2-9x-85}{(x+1)(x-2)(x+3)} = \frac{A}{x+1} + \frac{B}{x-2} + \frac{C}{x+3}$$

$$= \frac{A[(x-2)(x+3)] + B[(x+1)(x+3)] + C[(x+1)(x-2)]}{(x+1)(x-2)(x+3)}$$

$$\Rightarrow A[x^2+3x-2x-6] + B[x^2+3x+x+3] + C[x^2-2x+x-2] = \frac{2x^2-9x-85}{x-2}$$

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

$$\Rightarrow Ax^2 + A(x-6) + Bx^2 + 4Bx + 3B + Cx^2 - 2C(x-2)$$

$$\Rightarrow x^2[A+B+C] + x[A+4B-C] + [-6A+3B-2C]$$

$$2x^2-9x-85$$

$$\Rightarrow x^2[A+B+C] + x[A+4B-C] + B[-6A$$

$$+ 3B - 2C]$$

$$+ 3B - 2C]$$

$$+ 3B - 2C]$$

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

Multiply through by  $(x+1)(x-2)(x+3)$   
 $2x^2 - 9x - 86 = x^2 [A+B+C] + x[A+4B-C] +$   
 $[-6A+3B-2C]$

$A+B+C = 2$  ①

$A+4B-C = -9$  ②

$-6A+3B-2C = -35$  ③

$A = 2-B-C$  4

~~But we can't~~

$2-B-C+4B-C = -9$

$2-B+4B-C = -9$

$2+3B-2C = -9$

$3B-2C = -11$

$3B-2C = -11$  5

$-6A+3B-2C = -35$

$-6[2-B-C] + 3B-2C = -35$

$-12+6B+6C+3B-2C = -35$

$-6B+3B+6C-2C = -86+12$

$9B+4C = -23$  6

Multiply eqn ⑤ by 3 eqn ⑥ by 2

$12B-8C = -44$

$18B+8C = -46$

$30B = -90$



$$B = \frac{20}{30}$$

$$B = -8$$

Part 99 (5) (6) (7) (8)

$$3B - 2C = -11$$

$$3(-8) - 2(C) = -11$$

$$-9 - 2C = -11$$

$$-2C = -11 + 9$$

$$C = 1$$

Part eqn (7) & (8) m eqn (9)

$$4 > 2 - B - C$$

$$A > 2 - (-8) - 1$$

$$A > 2 + 8 - 1$$

$$A > 4$$

$$\int \frac{2x^2 - 9x - 36}{(x+1)(x-2)(x+3)} dx = \frac{4}{(x+1)} + \frac{-3}{(x-2)} + \frac{1}{(x+3)}$$

$$\int \frac{2x^2 - 9x - 36}{(x+1)(x-2)(x+3)} dx = \int \frac{4}{(x+1)} dx + \int \frac{-3}{(x-2)} dx + \int \frac{1}{(x+3)} dx$$

$$\int \frac{1}{x+3} dx$$

$$\int \frac{2x^2 - 9x - 36}{(x+1)(x-2)(x+3)} dx = 4 \ln|x+1| - 3 \ln|x-2| + \ln|x+3| + C$$