

19/11/2013

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

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

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

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

Let  $x=3$

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

$$\Rightarrow 18 - 27 - 35 = (3-2)(3+3)C$$

$$\Rightarrow -44 = 6C$$

$$C = -\frac{44}{6}$$

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

Let  $x=2$

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

$$\Rightarrow 8 - 18 - 35 = B(3)(5)$$

$$\Rightarrow -45 = 15B$$

$$B = -\frac{45}{15}$$

$$B = -3$$

$$B = -3$$

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

Let  $x=-1$

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

$$\Rightarrow 2 - 9 - 35 = A(-3)(2)$$

$$\Rightarrow -42 = -6A$$

$$\Rightarrow -24 = -6$$

$$\Rightarrow A = \frac{-24}{-6}$$

$$A = 4$$

$$\int \frac{2x^2 - 9x - 35}{(x+1)(x-2)(x+3)} = \int \frac{4}{x+1} + \int \frac{-3}{x-2} + \int \frac{-\frac{44}{6}}{x+3}$$

19/M4501/331

when  $x = -1$

$$(-1) = 4(-1) - 16 = B(-1 - 3)$$

$$-20 = B(-4)$$

$$B = \frac{-20}{-4}$$

$$B = 5$$

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

$$\int \frac{-1}{x-3}$$

$$u = x-3, \frac{du}{dx} = 1, dx = du$$

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

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

$$= -\ln u$$

$$\int \frac{5}{x+1}$$

$$u = x+1, \frac{du}{dx} = 1, dx = du$$

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

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

$$= 5 \ln u$$

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

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

17/11/2013

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

$$= \frac{1}{4} \int \frac{1}{u} \cdot du$$

$$= \frac{1}{4} \ln u$$

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

$$u = x + 3, \frac{du}{dx} = 1, dx = du$$

$$\int \frac{-5}{u} \cdot du$$

$$= \frac{-5}{1} \int \frac{1}{u} \cdot du$$

$$= -5 \ln u$$

$$\Rightarrow \frac{1}{4} \ln(x-1) - 5 \ln(x+3)$$

$$\textcircled{3} \int \frac{4x-16}{x^2-2x-3} dx$$

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

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

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

Set  $x = 3$

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

$$= 12 - 16 = A(4)$$

$$-4 = A(4)$$

$$A = \frac{-4}{4}$$

$$4$$

$$A = -1$$

$$\int \frac{4}{x+1}$$

$$u = x+1, \frac{du}{dx} = 1, dx = du$$

$$\int \frac{4}{u} \cdot du$$

$$4 \int \frac{1}{u} \cdot du$$

$$4 \ln u$$

$$\int \frac{-3}{x-2}$$

$$u = x-2, \frac{du}{dx} = 1, dx = du$$

$$\int \frac{-3}{u} \cdot du$$

$$-3 \int \frac{1}{u} \cdot du$$

$$-3 \ln u$$

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

$$u = x+3, \frac{du}{dx} = 1, dx = du$$

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

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

$$1 \ln u$$

$$\Rightarrow 4 \ln u (x+1) - 3 \ln u (x-2) + 1 \ln u (x+3) = A$$

Name: Olaosebikan Oluwademitole Deborah

Matric No: 191MHS01331

Dept: mbbs

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

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

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

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

When  $x = -3$

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

$$26 = B(-4)$$

$$\frac{26}{-4} = B$$

$$B = -5$$

When  $x = 1$

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

$$11-4 = A(4)$$

$$7 = A(4)$$

$$A = \frac{7}{4}$$

$$\int \frac{11-3x}{(x-1)(x+3)} = \int \frac{7/4}{x-1} + \int \frac{-5}{x+3}$$

$$\int \frac{7/4}{x-1}$$

$$u = x-1, \frac{du}{dx} = 1, dx = du$$

$$(8-x)A + (1+x)B = 11-3x$$

$$\frac{8}{(1+x)} + \frac{A}{(8-x)} = \frac{11-3x}{(1+x)(8-x)}$$

$$(8-x)A + (1+x)B = 11-3x$$
  
$$(1+8)A = 11 - (8)B = (8)B$$
  
$$(P)A = 11 - 8B =$$
  
$$(4)A = 11 - 8B$$
  
$$\frac{P}{P} = \frac{11-8B}{P}$$
  
$$1 = \frac{11-8B}{P}$$