19/MHS01/235 LEBILE CELINE. M.

MBBS: MATHS ASSIGNMENT ON INTEGRATION

4) $\int \frac{11-3x}{x^2+2x-3}$

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

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

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

$f(-3)$, $11-3(-3) = A(-3+3) + B(-3-1)$

$f(-3) = 11+9 = 0 + -4B$

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

$$\underline{B = -5}$$

$f(1) =$, $11-3(1) = A(1+3) + B(1-1)$

$f(1) = 11-3 = 4A$

$$\frac{8}{4} = \frac{4A}{4}$$

$$\underline{A = 2}$$

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

Let $P = x-1$ $\therefore dP/dx = 1$

$dx = dP/1$ $= \int \frac{2}{P} \cdot \frac{dP}{1} = 2\int \frac{1}{P} dP$

Therefore its, $\underline{2 \ln (x-1)}$

②

Let $u = x+3$; $du/dx = 1$

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

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

$\underline{-5\ln(x+3)}$

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

5 $\int \frac{4x-16}{x^2-2x-3}$

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

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

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

$f(-1) = -20 = -4A + 0$

~~$f(-1) =$~~ $\frac{-20}{-4} = \frac{-4A}{-4}$

$\underline{A = 5}$

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

$-4 = 0 + 4B$

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

$\underline{B = -1}$

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

Let $P = x+1$ | Let $u = x-3$

$dP/dx = 1$ | $du/dx = 1$

$dx = dP/1$ | $dx = du/1$

$\int \frac{5}{P} \cdot \frac{dP}{1}$ | $\int \frac{-1}{u} \cdot du$

$5 \int \frac{1}{P} dP$ | $-1 \int \frac{1}{u} \cdot du$

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

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

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

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

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

$f(-1) = -24 = -6A + 0 + 0$

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

$\underline{A = 4}$

$f(2) = -45 = 0 + 15B + 0$

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

$\underline{B = -3}$

$f(-3) = 10 = 0 + 0 + 10C$

$\frac{10}{10} = \frac{10C}{10}$; $\underline{C = 1}$

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

Let $p = x+1$

$dp/dx = 1$

$dx/1 \; dx = dp/1$

$\int \frac{4}{p} \cdot \frac{dp}{1}$

$4\int \frac{1}{p} \cdot dp$

$4\ln(x+1)$

Let $u = x-2$

$du/dx = 1$

$dx = du/1$

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

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

$-3\ln(x-2)$

Let $m = x+3$

$dm/dx = 1$

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

$\int \frac{1}{m} \cdot \frac{dm}{1}$

$1\int \frac{1}{m} \cdot dm$

$1\ln(x+3)$

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

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