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PT. MBBS.

RC: 19/MH501/416.

BE MAT 104.

N: 147.

### ASSIGNMENT.

1.  $\int \frac{u-3x}{x^2+2x-3} dx$        $u-3x$  as partial fraction.       $x^2+2x-3$

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

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

where  $x+3=0, x=-3$ .

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

$$1+9 = 0-4B$$

$$\frac{20}{-4} = -\frac{4B}{-4} \quad B = -5$$

when  $x=1 = 0, x=1$

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

$$(-3) = 4A$$

$$\frac{8}{4} = 4A \quad \therefore A = 2$$

$$\therefore \frac{2}{x-1} + \frac{-5}{x+3}$$

$$\int \frac{2}{x-1} dx + \int \frac{-5}{x+3} dx, \text{ Since } \int \frac{A}{ax+b} dx = A \ln \left| \frac{ax+b}{a} \right| + c$$

$$\Rightarrow 2 \ln|x-1| - 5 \ln|x+3|$$

$$2 \ln|x-1| - 5 \ln|x+3|$$

$$\int \frac{u-3x}{x^2+2x-3} = 2 \ln|x-1| - 5 \ln|x+3| + c$$

$$2. \int \frac{4x+6}{x^2-2x-3}$$

Resoluc  $\frac{4x+6}{x^2-2x-3}$  into partial fraction.

$$\frac{4x+6}{x^2-2x-3} = \frac{A}{x+1} + \frac{B}{x-3}$$

$$4x+6 = A(x-3) + B(x+1)$$

When  $x=3$

$$4x+6 = A(x-3) + B(x+1)$$

$$4(3)+6 = A(3-3) + B(3+1)$$

$$\frac{18}{4} = \frac{4B}{4} \quad \therefore B = \frac{9}{2}$$

When  $x=-1$

$$4(-1)+6 = A(-1-3) + B(-1+1)$$

$$\frac{2}{-4} = \frac{-4B}{-4} \quad A = -\frac{1}{2}$$

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

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

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

3.

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

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

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

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

$$\text{When } x+1=0 \quad x=-1.$$

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

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

$$-24 = -6A$$

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$$\underline{-6} \quad \underline{-6}$$

$$A = 4$$

$$\text{When } x-2=0.$$

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

$$C(2+1)(2-2)$$

$$8 - 18 - 35 = B(5) + C(0)$$

$$-45 = 5B$$

$$\underline{15} \quad \underline{15}$$

$$B = -3$$

$$\text{When } x+3=6$$

$$x=3$$

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

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

$$18 + 27 - 35 = C(-2)(-5)$$

$$\underline{10} \quad \underline{10}$$

$$\underline{10} \quad \underline{10}$$

$$C=1$$

$$\frac{4}{x+1} - \frac{3}{x-2} + \frac{1}{x+3}$$

$$\int \frac{4}{x+1} dx - \int \frac{3}{x-2} dx + \int \frac{1}{x+3} dx$$

$$= 4 \ln|x+1| - 3 \ln|x-2| + \ln|x+3|$$