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DEPT: MIBBS.

MATRIC NO: 19/MTHS01/365.

COLLEGE: MATHS.

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COURSE: MATH 104.

ASSIGNMENT

$$1) \int \frac{11-32x}{(x^2+2x-3)} dx.$$

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

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

Solutions.

$$1) \frac{11-32x}{(x+3)(x-1)} = \frac{A}{(x+3)} + \frac{B}{(x-1)}$$

$$11-32x = Ax - A + Bx + 3B$$

$$A+B = -3$$

$$-A+3B = 11$$

$$4B = 8$$

$$B = 2$$

$$A = 5$$

$$\int \frac{11-32x}{x^2+2x-3} = \int -\frac{5}{x+3} + \int \frac{2}{x-1}$$
$$= -5 \ln|x+3| + 2 \ln|x-1| + C.$$

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

$$4x-16 = Ax + A + Bx - 3B$$

$$A+B = 4$$

$$A-3B = -16$$

$$4B = 20$$

$$B = 5$$

$$A = -1$$

$$\int \frac{-1}{(2x-3)} + \int \frac{5}{(2x+1)} = -\ln|2x-3| + 5\ln|2x+1| + C.$$

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

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

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

$$= Ax^2 + Ax - 6A + Bx^2 + 2Bx - 3B + Cx^2 - 3Cx + 2C$$

$$A + B + C = 2 \quad \dots \textcircled{1}$$

$$A + 2B - 3C = -9 \quad \dots \textcircled{2}$$

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

$$\textcircled{1} + \textcircled{2}$$

$$2A + 3B - 2C = -7 \quad (\text{Prod. of } \textcircled{1} + \textcircled{2})$$

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

$$-4A = -42$$

$$A = 10.5$$

$$B = -9$$

$$C = 0.5$$

$$\int \frac{10.5}{x-1} - \frac{9}{x-2} + \frac{0.5}{x+3}$$

$$10.5 \ln|x-1| - 9 \ln|x-2| + 0.5 \ln|x+3|.$$