$-3B - 8C = -19$ ---(7) ×1

$-18B - 8C = -94$ --- (8)

(7)-(8) $-3B - 8C = -19$ ---9

$-15B = -75$ $\therefore B = 5$

from (5): $-15 - 8C = 19$

$C = -1/2$

from 4: $A = 2 - 5 - 1/2 = -7/2$ $\therefore A = -7/2$

$$\int \frac{2x^2 - 9x - 35}{(x-1)(x-2)(x+3)}\,dx = \int -\frac{7}{2}\,dx + \int \frac{5}{(x+2)}\,dx + \int \frac{1/2}{(x-3}\,dx$$

$$= \frac{-7}{2}\int \frac{dx}{x-1} + 5\int \frac{dx}{x-2} + \frac{1}{2}\int \frac{dx}{x-3}$$

$$= \frac{-7}{2}\ln|x-1| + 5\ln(x-2) + \frac{1}{2}\ln|x+3| + C$$

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19/MHS01/207
Assignment.

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

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

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

$f(1) \Rightarrow 8 = 4A \quad \therefore A = 2$

$f(-3) \Rightarrow 20 = -4B \quad \therefore B = -5$

$\int \frac{11-3x}{x^2+2x-3}\,dx = \int \frac{2}{x-1}\,dx - \int \frac{5}{x+3}\,dx = 2\int \frac{dx}{x-1} - 5\int \frac{dx}{x+3} = 2\ln u - \text{shut}$

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

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

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

$4x-16 = A(x-2) + Bx$

$f(0) \Rightarrow -16 = -2A \quad \therefore A = 8$

$f(2) \Rightarrow -8 = 2B \quad \therefore B = -4$

$$\int \frac{4x-16}{x^2-2x} = \int \frac{8}{x}\,dx - \int \frac{4}{(x-2)}\,dx = 8\int \frac{1}{x}\,dx - 4\int \frac{1}{x-2}\,dx$$

$$= 8\ln x + 4\ln(x-2) + c$$

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

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

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

$$2x^2-9x-35 = A(x^2-5x+6) + B(x^2+2x-3) + C(x^2-3x+2)$$

$$2x^2-9x-35 = Ax^2-5Ax+6A + Bx^2+2Bx-3B + Cx^2-3Cx+2C$$

$$2x^2-9x-35 = Ax^2+Bx^2+Cx^2+5Ax+2Bx-3Cx+6A-3B+2C$$

$$2x^2-9x-35 = (A+B+C)x^2 + (5A+2B-3C)x + (6A-3B+C)$$

$$A+B+C = 2 \quad ---\ (1)$$

$$5A+2B-3C = -9 \quad ---\ (2)$$

$$6A-3B-2C = -35 \quad ---\ (3)$$

$$A = 2-B-C \quad --\ 4$$

$$5(2-B-C)+2B-3C = -9$$

$$10-5B-5C+2B-3C = -9$$

$$-3B-3C = -19 \quad ---\ (5)$$

$$6(2-B-C)-3B+2C = 35$$

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

$$-9B-4C = -49 \quad --\ 6 \times 2$$

$\int \frac{dx}{x+3} = 2\ln u -$ shut