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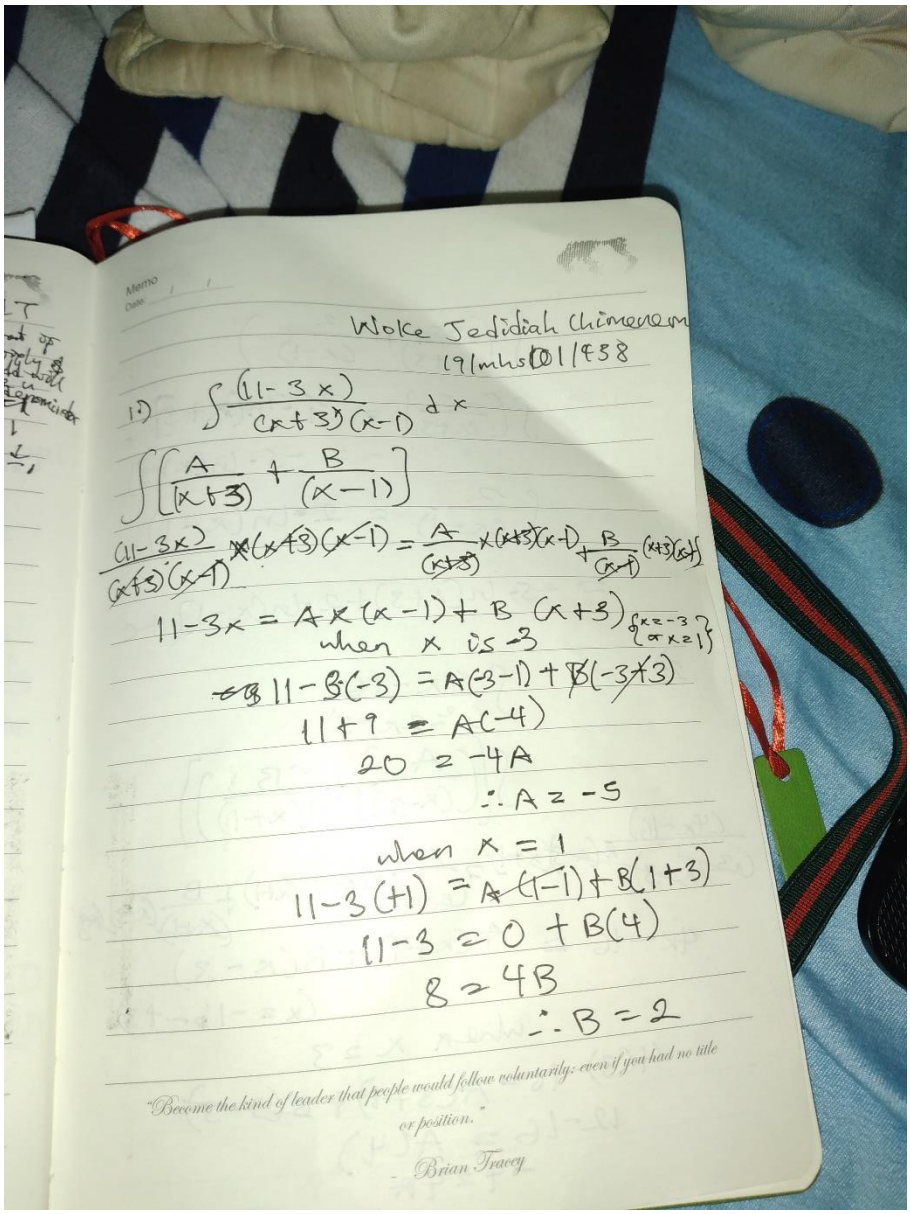

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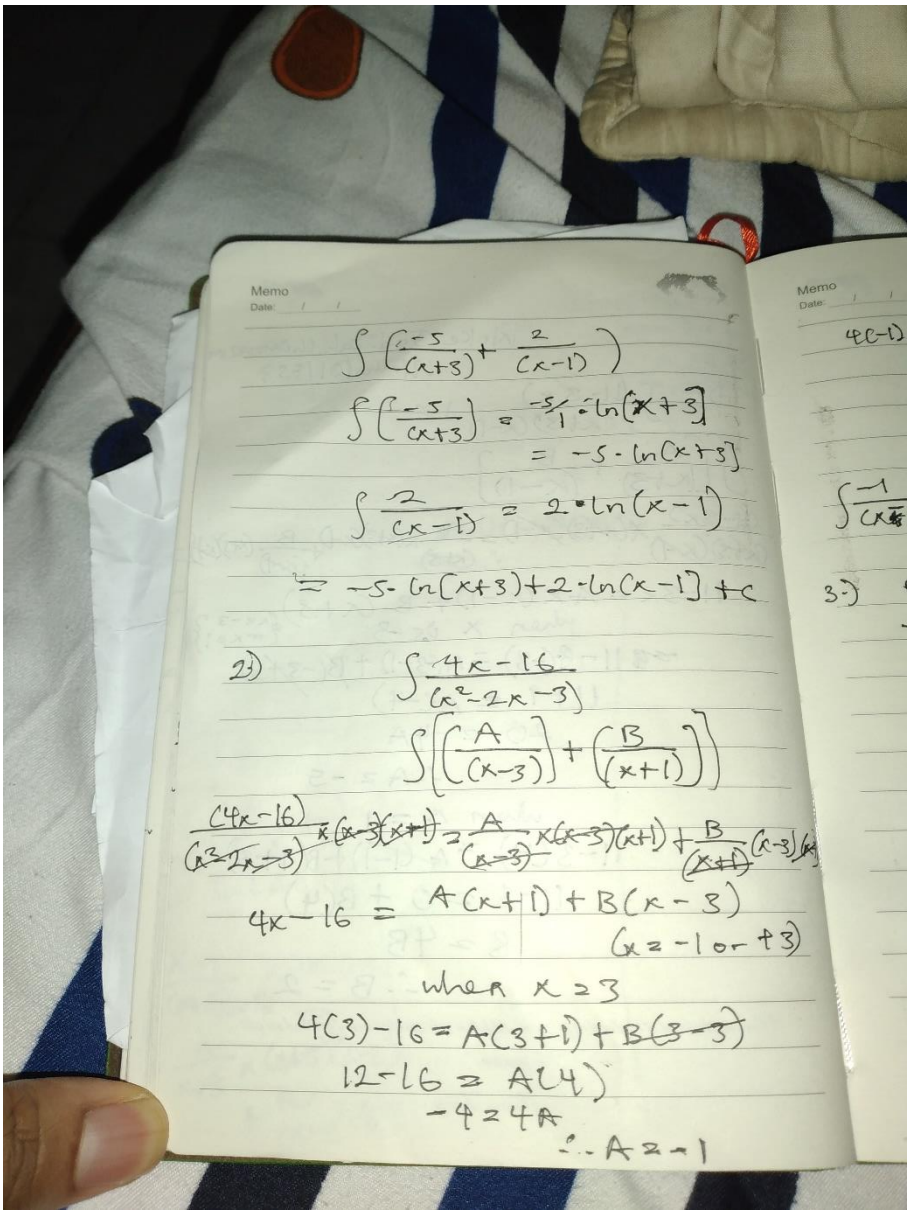

Memo
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$\int \left(\frac{-5}{(x+3)} + \frac{2}{(x-1)}\right)$

$\int \left(\frac{-5}{(x+3)}\right) = \frac{-5}{1} \cdot \ln[x+3]$

$= -5 \cdot \ln(x+3]$

$\int \frac{2}{(x-1)} = 2 \cdot \ln(x-1)$

$= -5 \cdot \ln[x+3) + 2 \cdot \ln(x-1] + c$

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

$\int \left[\left(\frac{A}{(x-3)}\right) + \left(\frac{B}{(x+1)}\right)\right]$

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

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

$(x = -1 \text{ or } +3)$

when $x = 3$

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

$12-16 = A(4)$

$-4 = 4A$

$\therefore A = -1$

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$4(-1)$

3.)

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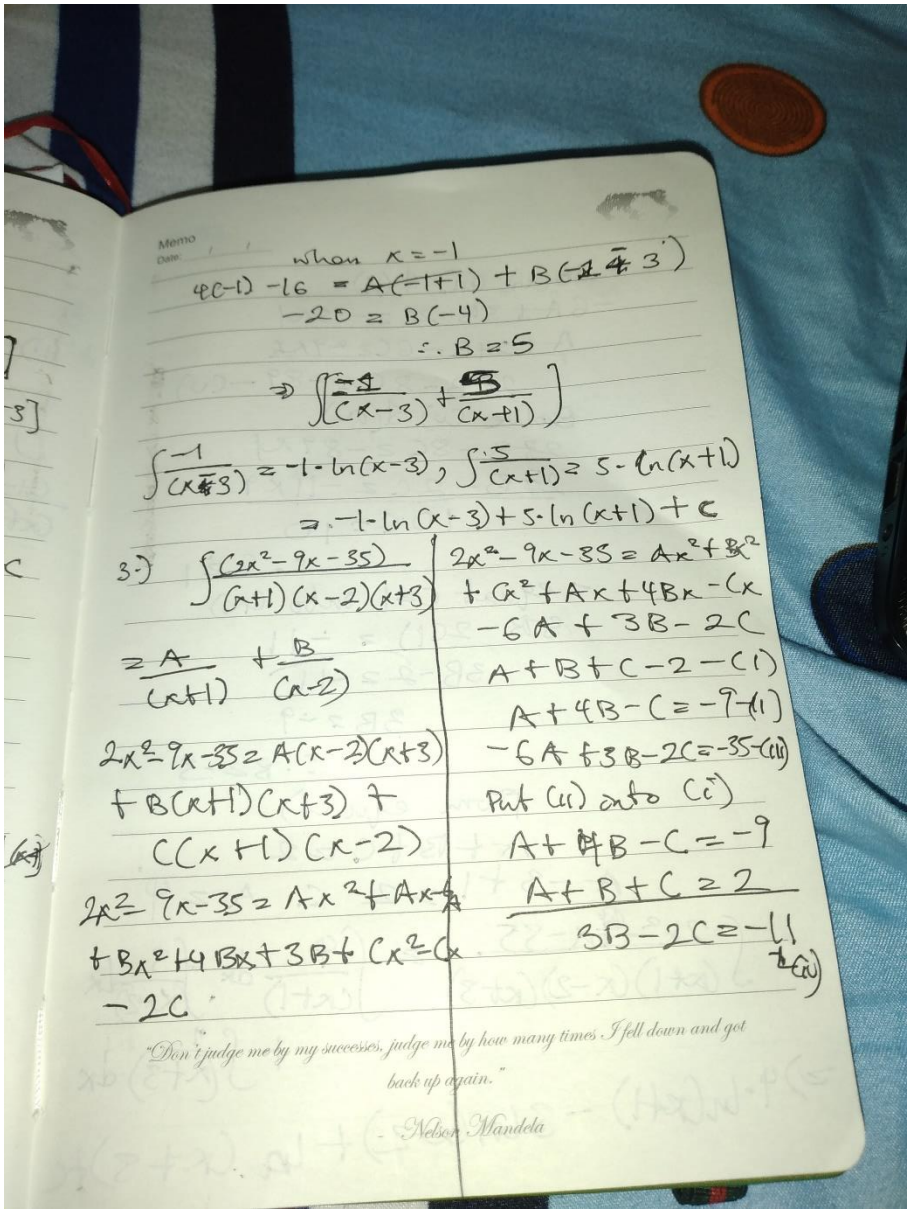

when $x=-1$

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

$-20 = B(-4)$

$\therefore B = 5$

$\Rightarrow \int\left[\frac{-1}{(x-3)}+\frac{5}{(x+1)}\right]$

$\int\frac{-1}{(x-3)} = -1\cdot\ln(x-3)$, $\int\frac{5}{(x+1)} = 5\cdot\ln(x+1)$

$= -1\cdot\ln(x-3)+5\cdot\ln(x+1)+C$

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

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

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

$2x^2-9x-35 = Ax^2+Ax-6A+Bx^2+4Bx+3B+Cx^2-Cx-2C$

$2x^2-9x-35 = Ax^2+Bx^2+Cx^2+Ax+4Bx-Cx-6A+3B-2C$

$A+B+C-2-(i)$

$A+4B-C=-9-(ii)$

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

Put (ii) into (i)

$A+4B-C=-9$

$A+B+C=2$

$3B-2C=-11$ (iv)

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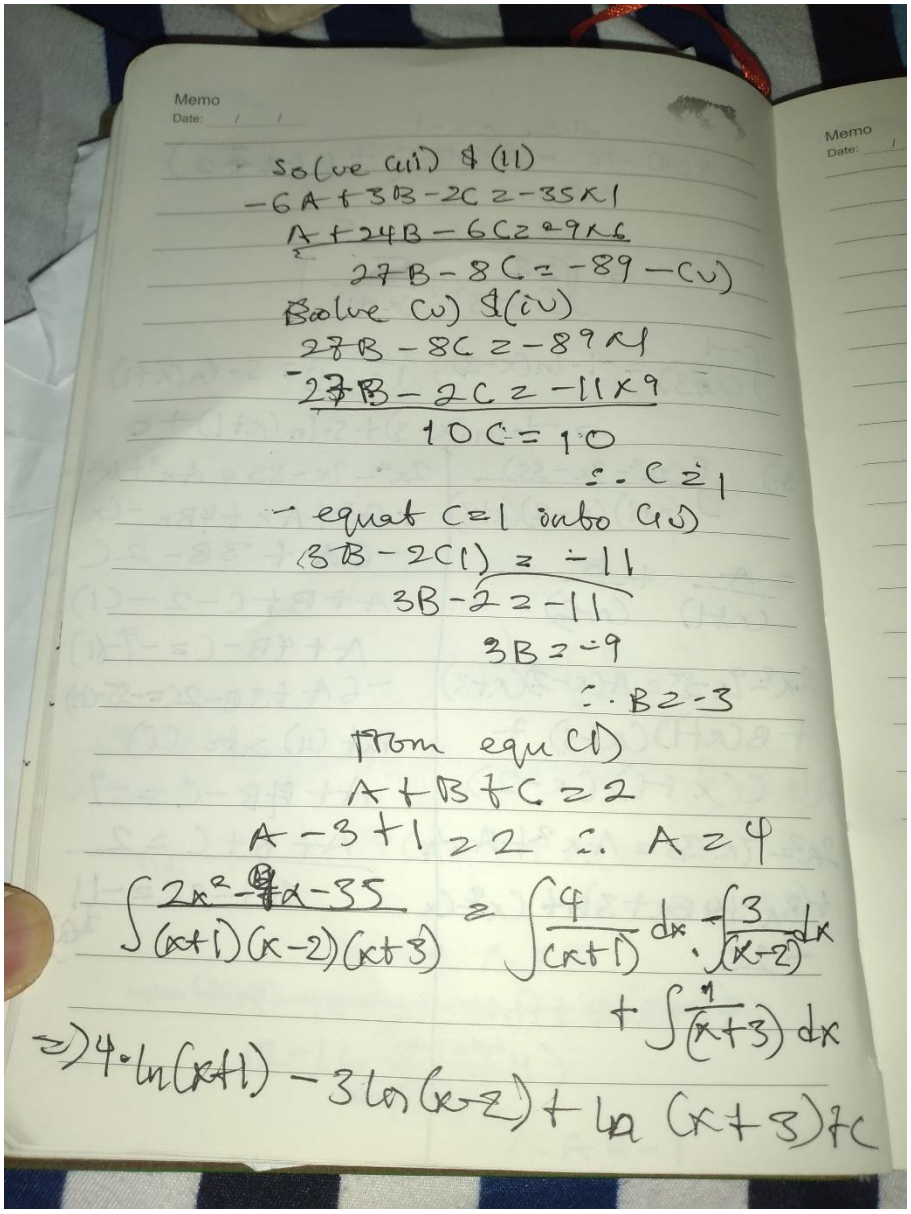

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Solve (iii) & (ii)

$-6A + 3B - 2C = -35 \times 1$

$4A + 24B - 6C = 9 \times 6$

$27B - 8C = -89 \quad (v)$

Solve (v) & (iv)

$27B - 8C = -89 \times 1$

$27B - 2C = -11 \times 9$

$10C = 10$

$\therefore C = 1$

Put $C = 1$ into (v)

$3B - 2(1) = -11$

$3B - 2 = -11$

$3B = -9$

$\therefore B = -3$

From eqn (i)

$A + B + C = 2$

$A - 3 + 1 = 2 \quad \therefore A = 4$

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

$\Rightarrow 4\ln(x+1) - 3\ln(x-2) + \ln(x+3) + C$