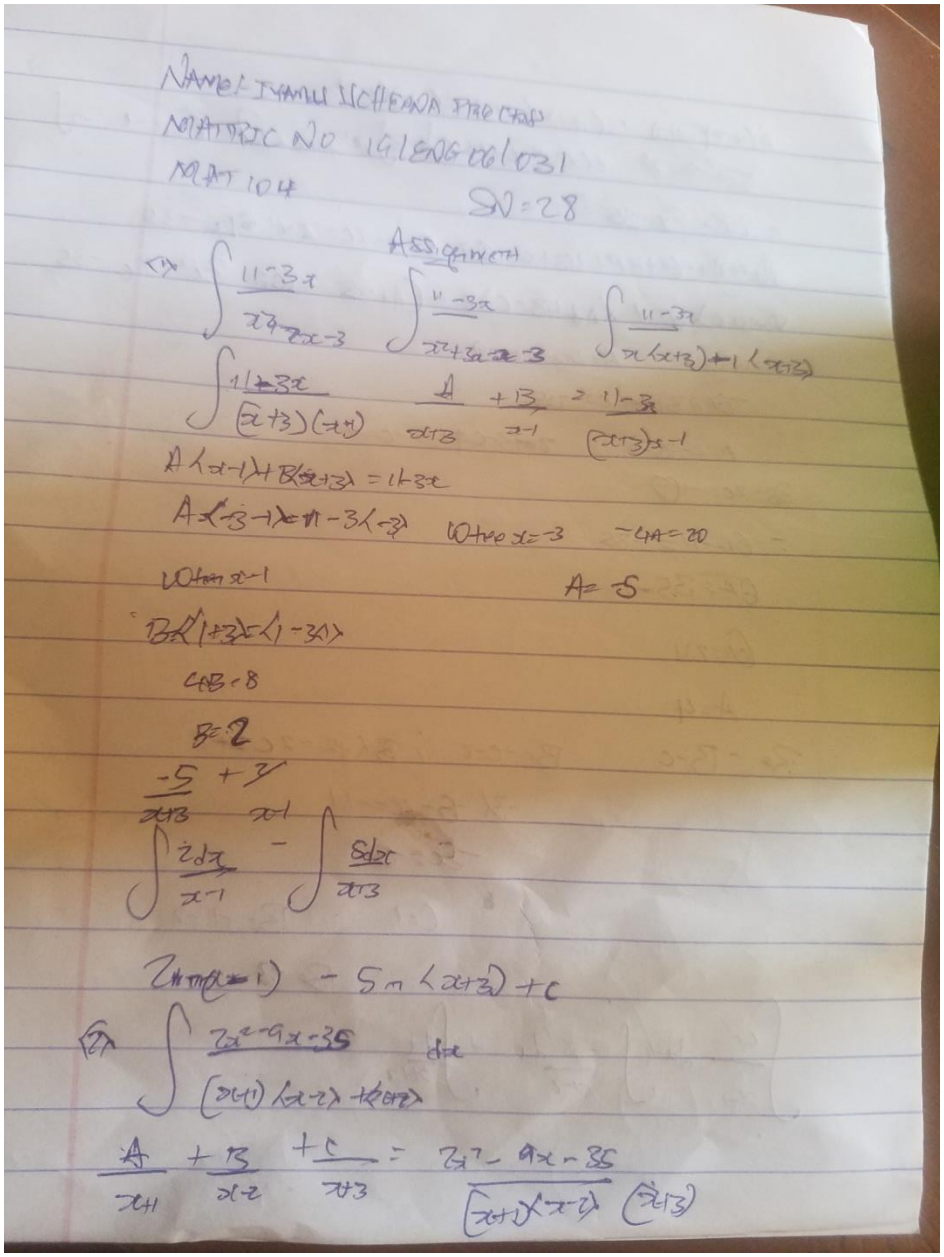
IYAMU UCHENNA PRECIOUS

MECHANICAL ENGINEERING

SN 28

MAT104



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

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

$=2x^2-9x-35$

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

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

$A+B+C=2\qquad A+4B-C=-9$

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

$A=2-B-C\qquad 2-B-C+4B-C=-9$

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

$6A-11=-35$

$6A=35-11$

$6A=24$

$A=4$

$B=-B-C\qquad B=-C-2\quad ;\ 3(-2-2C=-11$

$-3(-C-2C=-11$

$-5C=-5$

$C=1\qquad B=-1-2$

$B=-3$

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

(3) $\int \frac{dx}{x^2+a^2}$

$\int \frac{dx}{x^2+11^2}$

$x = 11\tan\theta$

$\frac{dx}{d\theta} = 11\sec^2\theta$

$dx = 11\sec^2\theta\, d\theta$

$x^2+11^2 = 11^2\tan\theta + 11^2$

$= 11^2(\tan\theta+1)$

$\tan^2\theta + 1 = \sec^2\theta$

$x^2+11^2 = 11^2\sec\theta$ $\int \frac{11\sec^2\theta}{11^2\sec^2\theta}\, d\theta$

$\frac{1}{11}\int d\theta$

$\frac{1}{11}\theta + c$ $x = 11\tan\theta$