Solution of System of linear Equation

$2x_1 + 3x_2 - x_3 = 5$ — (I)
$4x_1 + 4x_2 - 3x_3 = 3$ — (II)
$2x_1 - 3x_2 + x_3 = -1$ — (III)

$m \times n$
3×3

No of equation $\geq$ Variable

Guassion Elimination Method:

Septract equation III from I

$2x_1 + 3x_2 - x_3 = 5$
$2x_1 - 3x_2 + x_3 = -1$
$+ \quad - \quad +$ Changing Sign
$6x_2 - 2x_3 = 6$ — (IV)

Multiply equation III by 2 and Sbtract from II.

$2(2x_1 - 3x_2 + x_3 = -1) \Rightarrow (4x_1 - 6x_2 + 2x_3 = 2)$
$4x_1 + 3x_2 - 3x_3 = 5$
$4x_1 - 6x_2 + 2x_3 = 2$
$+ \quad - \quad +$
$10x_2 - 5x_3 = 5$

dividing by 5

$\frac{10x_2}{5} - \frac{5x_3}{5} = \frac{5}{5}$

$2x_2 - x_3 = 1$ — (V)

Multiply equation V by 3

$3(2x_2 - x_3 = 1)$

$6x_2 - 3x_3 = 3$

Subtract eqn V from IV

$6x_2 - 2x_3 = 6$

$6x_2 - 3x_3 = 3$

$+ \quad -$

$\boxed{x_3 = 3}$

Putting value of x_3 in eqn V

$2x_2 - 3 = 1$

$2x_2 = 1 + 3$

$2x_2 = 4$

$x_2 = 4/2 \Rightarrow \boxed{x_2 = 2}$

Putting value of x_3 and x_2 in eqn (1)

$2x_1 + 3(2) - 3 = 5$

$2x_1 + 6 - 3 = 5$

$2x_1 + 3 = 5$

$2x_1 = 5 - 3$

$2x_1 = 2$

$x_1 = 2/2 \quad \boxed{x_1 = 1}$