5.2.45

EE25BTECH11043 - Nishid Khandagre

Question: Solve the system of linear equations:

$$x + 2y = 2 \tag{0.1}$$
$$2x + 3y = 3 \tag{0.2}$$

Solution: We have:

$$x + 2y = 2 \tag{0.3}$$
$$2x + 3y = 3 \tag{0.4}$$

$$\begin{pmatrix} 1 & 2 \\ 2 & 3 \end{pmatrix} \begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 2 \\ 3 \end{pmatrix} \tag{0.5}$$

Write augmented matrix

$$\left(\begin{array}{cc|c} 1 & 2 & 2 \\ 2 & 3 & 3 \end{array}\right) \tag{0.6}$$

Eliminate first column $R_2 \to R_2 - 2R_1$

$$\left(\begin{array}{cc|c} 1 & 2 & 2 \\ 0 & -1 & -1 \end{array}\right) \tag{0.7}$$

Then $R_2 \to -R_2$

$$\left(\begin{array}{cc|c} 1 & 2 & 2 \\ 0 & 1 & 1 \end{array}\right) \tag{0.8}$$

Then $R_1 \to R_1 - 2R_2$

$$\left(\begin{array}{cc|c} 1 & 0 & 0 \\ 0 & 1 & 1 \end{array}\right) \tag{0.9}$$

$$\begin{pmatrix} x \\ y \end{pmatrix} = \begin{pmatrix} 0 \\ 1 \end{pmatrix} \tag{0.10}$$

Therefore

$$x = 0 \tag{0.11}$$
$$y = 1 \tag{0.12}$$

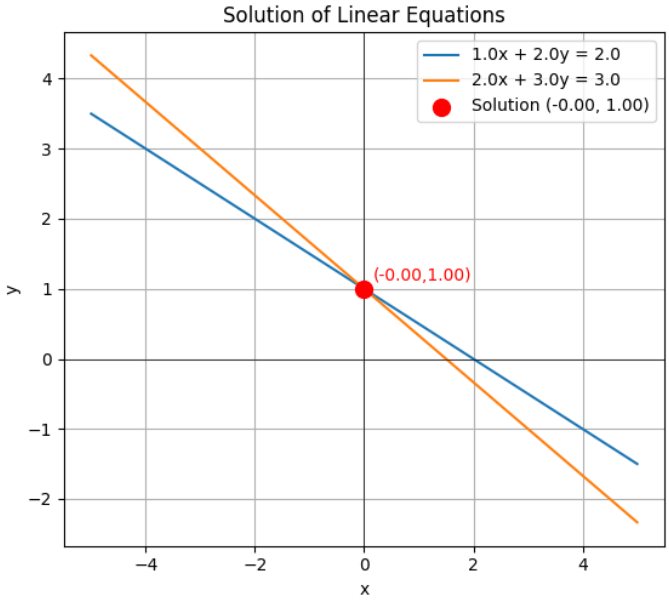
Solution of Linear Equations
1.0x + 2.0y = 2.0
2.0x + 3.0y = 3.0
Solution (-0.00, 1.00)
(-0.00,1.00)
y
x
4
3
2
1
0
−1
−2
−4
−2
0
2
4

Fig. 0.1