

Q.2. find the value of x . if

$$[x \ 1]_{1 \times 3} \begin{bmatrix} 1 & 3 & 2 \\ 2 & 5 & 1 \\ 15 & 3 & 2 \end{bmatrix}_{3 \times 3} \begin{bmatrix} 1 \\ 2 \\ x \end{bmatrix}_{3 \times 1} = 0$$

Soln. We have $[1x \ 1]_{1 \times 3} \begin{bmatrix} 1 & 3 & 2 \\ 2 & 5 & 1 \\ 15 & 3 & 2 \end{bmatrix}_{3 \times 3} \begin{bmatrix} 1 \\ 2 \\ x \end{bmatrix}_{3 \times 1} = 0$

$$\Rightarrow \begin{bmatrix} 1+2x+15 & 3+5x+3 & 2+x+2 \end{bmatrix}_{1 \times 3} \begin{bmatrix} 1 \\ 2 \\ x \end{bmatrix}_{3 \times 1} = 0$$

$$[16+2x \quad 5x+6 \quad x+4]_{1 \times 3} \begin{bmatrix} 1 \\ 2 \\ x \end{bmatrix}_{3 \times 1} = 0$$

$$[16+2x+10x+12+x^2+4x] = 0$$

$$[x^2+16x+20] = 0$$

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$$(x+2)(x+14) = 0$$

$$x = -2, -14.$$