

Exercise 21

In Exercises 19–22, determine the value(s) of h such that the matrix is the augmented matrix of a consistent linear system.

$$\begin{bmatrix} 1 & 3 & -2 \\ -4 & h & 8 \end{bmatrix}$$

Solution

The aim is to write the augmented matrix in triangular form.

$$\left[\begin{array}{cc|c} 1 & 3 & -2 \\ -4 & h & 8 \end{array} \right]$$

To make the bottom left entry 0, multiply the first row by 4 and add it to the second row.

$$\left[\begin{array}{cc|c} 1 & 3 & -2 \\ 0 & h + 12 & 0 \end{array} \right]$$

This last row implies that $0x_1 + (h + 12)x_2 = 0$. Here h can take any value because $x_2 = 0$ can satisfy the equation.