

Exercise 20

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

$$\left[\begin{array}{cc|c} 1 & h & -3 \\ -2 & 4 & 6 \end{array} \right]$$

Solution

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

$$\left[\begin{array}{cc|c} 1 & h & -3 \\ -2 & 4 & 6 \end{array} \right]$$

To make the bottom left entry 0, multiply the first row by 2 and add it to the second row.

$$\left[\begin{array}{cc|c} 1 & h & -3 \\ 0 & 4 + 2h & 0 \end{array} \right]$$

This last row implies that $0x_1 + (4 + 2h)x_2 = 0$. Here h can take any value because $x_2 = 0$ can satisfy the equation.