

**Exercise 19**

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

$$\begin{bmatrix} 1 & h & 4 \\ 3 & 6 & 8 \end{bmatrix}$$

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**Solution**

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

$$\begin{bmatrix} 1 & h & 4 \\ 3 & 6 & 8 \end{bmatrix}$$

To make the bottom left entry 0, multiply the first row by  $-3$  and add it to the second row.

$$\begin{bmatrix} 1 & h & 4 \\ 0 & 6 - 3h & -4 \end{bmatrix}$$

This last row implies that  $0x_1 + (6 - 3h)x_2 = -4$ . For a solution to exist, it's necessary to have

$$6 - 3h \neq 0.$$

Solve for  $h$ .

$$h \neq 2.$$