Page and Paur, *Topics in Finite Mathematics*
Section 1.1 Answers

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2. $a_{31} = 3$, $b_{23} = 4$, c_{13} does not exist because $\mathbf{C}$ only has 2 columns, $d_{41} = 5$.

10. The matrix equation gives rise to the following system of six equations:

$$\begin{aligned} 3y &= 6, \\ 12 &= 16 + 2x, \\ 0 &= 4u + 4, \\ 6z &= 4z + 6, \\ 3x &= -6, \\ 6 &= 8 - 2u. \end{aligned}$$

The first four are easily solved to yield $y = 2$, $x = -2$, $u = -1$, $z = 3$. The fifth yields $x = -2$, which is consistent with what we have found so far. However, the sixth yields $u = 1$, which is *not* consistent with what we have found so far. Thus there is no consistent way to assign values to x, y, z, and u.

12. (a)

$$\mathbf{A} = \begin{pmatrix} 2 & 3 & 4 & 3 & 2 \\ 1 & 2 & 3 & 3 & 1 \\ 0 & 2 & 2 & 2 & 1 \end{pmatrix}, \quad \mathbf{B} = \begin{pmatrix} 1 & 2 & 3 & 3 & 1 \\ 1 & 1 & 2 & 2 & 1 \\ 1 & 1 & 1 & 1 & 0 \end{pmatrix}$$

(b)

$$\mathbf{A} + \mathbf{B} = \begin{pmatrix} 3 & 5 & 7 & 6 & 3 \\ 2 & 3 & 5 & 5 & 2 \\ 1 & 3 & 3 & 3 & 1 \end{pmatrix}$$

(c) The sum of the two given matrices is the total matrix of unsold suits. It is

$$\mathbf{C} = \begin{pmatrix} 1 & 1 & 4 & 2 & 1 \\ 1 & 0 & 1 & 2 & 0 \\ 0 & 1 & 2 & 2 & 1 \end{pmatrix}.$$

The matrix of suits that were sold is

$$(\mathbf{A}+\mathbf{B})-\mathbf{C}=\begin{pmatrix}2 & 4 & 3 & 4 & 2\\ 1 & 3 & 4 & 3 & 2\\ 1 & 2 & 1 & 1 & 0\end{pmatrix}.$$