

17–22 ■ Matrix Equations Solve the matrix equation for the unknown matrix X , or explain why no solution exists.

$$A = \begin{bmatrix} 4 & 6 \\ 1 & 3 \end{bmatrix} \quad B = \begin{bmatrix} 2 & 5 \\ 3 & 7 \end{bmatrix}$$

 **17. $2X + A = B$**

$$2X = B - A$$

$$X = \frac{1}{2}(B - A)$$

$$X = \frac{1}{2} \left(\begin{bmatrix} 2 & 5 \\ 3 & 7 \end{bmatrix} - \begin{bmatrix} 4 & 6 \\ 1 & 3 \end{bmatrix} \right) = \frac{1}{2} \begin{bmatrix} -2 & -1 \\ 2 & 4 \end{bmatrix}$$

$$X = \begin{bmatrix} -1 & -\frac{1}{2} \\ 1 & 2 \end{bmatrix}$$

$$C = \begin{bmatrix} 2 & 3 \\ 1 & 0 \\ 0 & 2 \end{bmatrix} \quad D = \begin{bmatrix} 10 & 20 \\ 30 & 20 \\ 10 & 0 \end{bmatrix}$$