ADDING AND SUBTRACTING MATRICES **Perform the indicated operation, if possible. If not possible, state the reason.**

4. $\begin{bmatrix} 5 & 2 \\ -1 & 8 \end{bmatrix} + \begin{bmatrix} -8 & 10 \\ -6 & 3 \end{bmatrix}$ **5.** $\begin{bmatrix} 10 & -8 \\ 5 & -3 \end{bmatrix} - \begin{bmatrix} 12 & -3 \\ 3 & -4 \end{bmatrix}$ **6.** $\begin{bmatrix} 4 & -5 \\ 8 & 1 \end{bmatrix} - \begin{bmatrix} 2 \\ -1 \end{bmatrix}$

7. $\begin{bmatrix} 1.2 & 5.3 \\ 0.1 & 4.4 \\ 6.2 & 0.7 \end{bmatrix} + \begin{bmatrix} 2.4 & -0.6 \\ 6.1 & 3.1 \\ 8.1 & -1.9 \end{bmatrix}$ **8.** $\begin{bmatrix} 8 & 3 \\ 9 & -1 \\ 4 & 5 \end{bmatrix} + \begin{bmatrix} 5 & -1 & 0 \\ 6 & 2 & -3 \\ 8 & -1 & 2 \end{bmatrix}$ **9.** $\begin{bmatrix} 7 & -3 \\ 12 & 5 \\ -4 & 11 \end{bmatrix} - \begin{bmatrix} 9 & 2 \\ -2 & 6 \\ 6 & 5 \end{bmatrix}$

EXAMPLE 2 on p. 188 for Exs. 10–15

MULTIPLYING BY A SCALAR **Perform the indicated operation.**

10. $2\begin{bmatrix} -1 & 4 \\ 3 & -6 \end{bmatrix}$ **11.** $-3\begin{bmatrix} 2 & 0 & -5 \\ 4 & 7 & -3 \end{bmatrix}$ **12.** $-4\begin{bmatrix} 2 & -3 & -2 \\ -\frac{5}{8} & \frac{11}{2} & \frac{7}{4} \end{bmatrix}$

13. $1.5\begin{bmatrix} -2 & 3.4 & 1.6 \\ 5.4 & 0 & -3 \end{bmatrix}$ **14.** $\frac{1}{2}\begin{bmatrix} -2 & 8 & 12 \\ 20 & -1 & 0 \\ -8 & 10 & 2 \end{bmatrix}$ **15.** $-2.2\begin{bmatrix} 6 & 3.1 & 4.5 \\ -1 & 0 & 2.5 \\ 5.5 & -1.8 & 6.4 \end{bmatrix}$

MATRIX OPERATIONS **Use matrices A, B, C, and D to evaluate the matrix expression.**

$A = \begin{bmatrix} 5 & -4 \\ 3 & -1 \end{bmatrix}$ $B = \begin{bmatrix} 18 & -12 \\ -6 & 0 \end{bmatrix}$ $C = \begin{bmatrix} 1.8 & -1.5 & 10.6 \\ -8.8 & 3.4 & 0 \end{bmatrix}$ $D = \begin{bmatrix} 7.2 & 0 & -5.4 \\ 2.1 & -1.9 & 3.3 \end{bmatrix}$

16. $A + B$ **17.** $B - A$ **18.** $4A - B$ **19.** $\frac{2}{3}B$

20. $C + D$ **21.** $C + 3D$ **22.** $D - 2C$ **23.** $0.5C - D$

EXAMPLE 4 on p. 190 for Exs. 24–27

SOLVING MATRIX EQUATIONS **Solve the matrix equation for x and y.**

24. $\begin{bmatrix} -1 & 3x \\ -4 & 5 \end{bmatrix} = \begin{bmatrix} -1 & -18 \\ 2y & 5 \end{bmatrix}$ **25.** $\begin{bmatrix} -2x & 6 \\ 1 & -8 \end{bmatrix} + 2\begin{bmatrix} 5 & -1 \\ -7 & 6 \end{bmatrix} = \begin{bmatrix} -9 & 4 \\ -13 & y \end{bmatrix}$

26. $2\begin{bmatrix} 8 & -x \\ 5 & 6 \end{bmatrix} - \begin{bmatrix} 3 & -9 \\ 10 & -4y \end{bmatrix} = \begin{bmatrix} 13 & 4 \\ 0 & 16 \end{bmatrix}$ **27.** $4x\begin{bmatrix} -1 & 2 \\ 3 & 6 \end{bmatrix} = \begin{bmatrix} 8 & -16 \\ -24 & 3y \end{bmatrix}$

28. **TAKS REASONING** Based on the equation below, what is the value of the expression $3x - 2y$?

$$\begin{bmatrix} 2x & 0 \\ 0.5 & -0.75 \end{bmatrix} = \begin{bmatrix} 6.4 & 0 \\ 0.5 & 3y \end{bmatrix}$$

Ⓐ 7.15 Ⓑ 9.1 Ⓒ 10.1 Ⓓ 20.7

29. **TAKS REASONING** Find two matrices A and B such that $2A - 3B = \begin{bmatrix} 5 & 0 \\ -1 & 2 \end{bmatrix}$.

30. **CHALLENGE** Find the matrix X that makes the equation true.

a. $X + \begin{bmatrix} -5 & 0 \\ 4 & -3 \end{bmatrix} = \begin{bmatrix} 7 & -8 \\ -3 & 5 \end{bmatrix}$ **b.** $X - \begin{bmatrix} 2 & 3 \\ 5 & 0 \end{bmatrix} = \begin{bmatrix} 8 & 6 \\ -1 & 3 \end{bmatrix}$

c. $-X + \begin{bmatrix} -3 & 1 \\ 4 & 7 \end{bmatrix} = \begin{bmatrix} 8 & -9 \\ 0 & 10 \end{bmatrix}$ **d.** $3X - \begin{bmatrix} 11 & -6 \\ 2 & 1 \end{bmatrix} = \begin{bmatrix} -13 & 15 \\ -19 & 2 \end{bmatrix}$