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# Practice

Student Edition
Pages 186–193

## An Introduction to Matrices

***Perform the indicated operation.***

1. $4\begin{bmatrix}1 & 5 & 9\\3 & 6 & 3\\0 & 7 & 2\end{bmatrix}\begin{bmatrix}4 & 20 & 36\\12 & 24 & 12\\0 & 28 & 8\end{bmatrix}$

2. $-1\begin{bmatrix}6 & -4\\3 & -2\\5 & -5\end{bmatrix}\begin{bmatrix}-6 & 4\\-3 & 2\\-5 & 5\end{bmatrix}$

3. $\frac{1}{2}\begin{bmatrix}-8 & 0\\2 & -12\\6 & -14\end{bmatrix}\begin{bmatrix}-4 & 0\\1 & -6\\3 & -7\end{bmatrix}$

4. $-1.1\begin{bmatrix}0.75 & 0.1\\0.99 & 0.7\end{bmatrix}\begin{bmatrix}-0.825 & -0.11\\-1.089 & -0.77\end{bmatrix}$

***Solve for the variables.***

5. $\begin{bmatrix}3x & 4y\\-48 & 49\end{bmatrix} = \begin{bmatrix}27 & -16\\-3w & 7z\end{bmatrix}$

$x = 9, y = -4, w = 16, z = 7$

6. $\begin{bmatrix}3x\\y + 4\end{bmatrix} = \begin{bmatrix}y + 8\\17\end{bmatrix}$

$x = 7, y = 13$

7. $x\begin{bmatrix}2 & -5\\7 & y\end{bmatrix} = \begin{bmatrix}8 & -20\\z & 24\end{bmatrix}$

$x = 4, y = 6, z = 28$

8. $5\begin{bmatrix}x & y + 2\\6 & z\end{bmatrix} = \begin{bmatrix}10 & 25\\2z & 30x + 5y\end{bmatrix}$

$x = 2, y = 3, z = 15$

9. Use Matrix Logic. The Peterson children are 13, 14, and 15 years old. One collects stamps, one collects coins, and one collects shells. From the clues, find each child's age and what he or she collects.

- The oldest collects stamps.
- Bart collects coins.
- Annette is older than Cassie.
- The 14-year-old does not collect coins.

| | 13 | 14 | 15 | stamps | coins | shells |
|---|---|---|---|---|---|---|
| Annette | | | ✔ | ✔ | | |
| Bart | ✔ | | | | ✔ | |
| Cassie | | ✔ | | | | ✔ |

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## Adding and Subtracting Matrices

*Perform the indicated operations.*

1. $3\begin{bmatrix} 1 & 5 \\ -1 & -5 \end{bmatrix} + 4\begin{bmatrix} -4 & -3 \\ -2 & -1 \end{bmatrix}$

$\begin{bmatrix} -13 & 3 \\ -11 & -19 \end{bmatrix}$

2. $\begin{bmatrix} 2 & -1 \\ 3 & 7 \\ 14 & -9 \end{bmatrix} + \begin{bmatrix} -6 & 9 \\ 7 & -11 \\ -8 & 17 \end{bmatrix}$

$\begin{bmatrix} -4 & 8 \\ 10 & -4 \\ 6 & 8 \end{bmatrix}$

3. $6\begin{bmatrix} 1 \\ -3 \\ 0 \end{bmatrix} + 5\begin{bmatrix} 2 \\ 7 \\ -8 \end{bmatrix} - 3\begin{bmatrix} -1 \\ 4 \\ 12 \end{bmatrix}$

$\begin{bmatrix} 19 \\ 5 \\ -76 \end{bmatrix}$

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

$\begin{bmatrix} 47 & -2 \\ 9 & 34 \\ 48 & -41 \end{bmatrix}$

5. $7\begin{bmatrix} 2 & -1 & 8 \\ 4 & 7 & 9 \end{bmatrix} - 2\begin{bmatrix} -1 & 4 & -3 \\ 7 & 2 & -6 \end{bmatrix}$

$\begin{bmatrix} 16 & -15 & 62 \\ 14 & 45 & 75 \end{bmatrix}$

6. $\frac{3}{4}\begin{bmatrix} 8 & 12 \\ -16 & 20 \end{bmatrix} + \frac{2}{3}\begin{bmatrix} 27 & -9 \\ 54 & -18 \end{bmatrix}$

$\begin{bmatrix} 24 & 3 \\ 24 & 3 \end{bmatrix}$

7. $\frac{1}{2}\begin{bmatrix} 6 & 12 \\ 4 & 24 \end{bmatrix} - \frac{1}{4}\begin{bmatrix} 8 & 16 \\ 0 & 44 \end{bmatrix}$

$\begin{bmatrix} 1 & 2 \\ 2 & 1 \end{bmatrix}$

8. $\frac{1}{2}\begin{bmatrix} -4 & -8 \\ 100 & 200 \\ 50 & 80 \end{bmatrix} + \begin{bmatrix} 5 & 10 \\ 20 & 30 \\ 40 & 60 \end{bmatrix}$

$\begin{bmatrix} 3 & 6 \\ 70 & 130 \\ 65 & 100 \end{bmatrix}$

*Solve for the variables.*

9. $\begin{bmatrix} 2x \\ x \end{bmatrix} - \begin{bmatrix} 8y \\ y \end{bmatrix} = \begin{bmatrix} 12 \\ 1 \end{bmatrix}$ $x = -\frac{2}{3}; y = -\frac{5}{3}$

10. $\begin{bmatrix} y \\ y \end{bmatrix} + \begin{bmatrix} 8 \\ 4 \end{bmatrix} = \begin{bmatrix} 3x \\ 17 \end{bmatrix}$ $x = 7; y = 13$