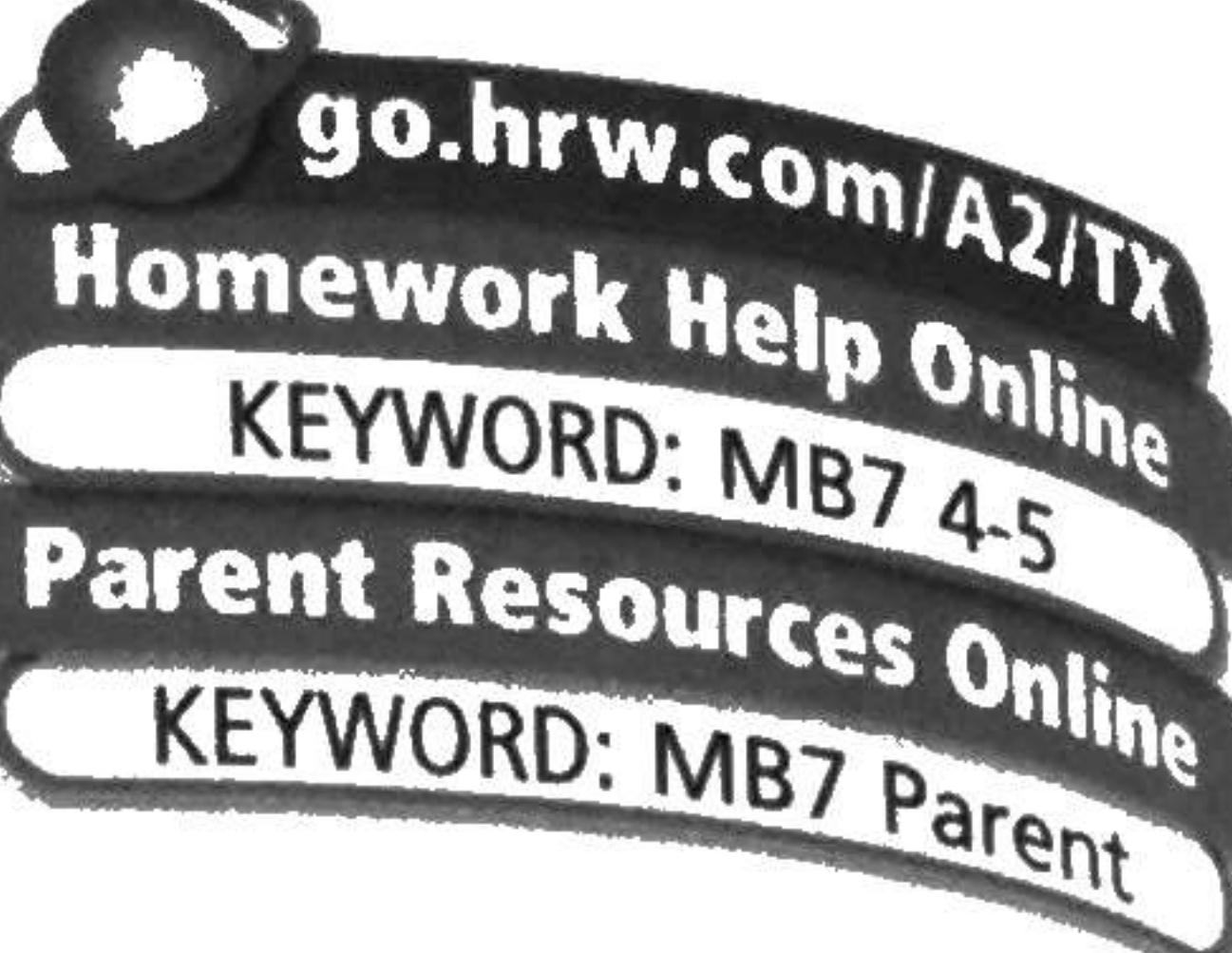


# Exercises



## GUIDED PRACTICE

1. **Vocabulary** Describe how to create a *matrix equation* from a system of equations.

PLE 1

Determine whether the given matrices are inverses.

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$$2. \begin{bmatrix} 8 & 4 \\ 2 & 1 \end{bmatrix} \begin{bmatrix} -\frac{1}{8} & \frac{3}{2} \\ \frac{1}{2} & -1 \end{bmatrix}$$

$$3. \begin{bmatrix} 1 & 0.4 & 1 \\ 1.2 & 0 & 0.8 \\ -1.6 & 0.2 & -1 \end{bmatrix} \begin{bmatrix} 3 & 12.5 & 2 \\ -1.6 & 2 & -1 \\ 5 & 1 & -10 \end{bmatrix}$$

$$4. \begin{bmatrix} 1 & 1 \\ 0 & 1 \end{bmatrix} \begin{bmatrix} 1 & -1 \\ 0 & 1 \end{bmatrix}$$

PLE 2

Find the inverse of the matrix, if it is defined.

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$$5. \begin{bmatrix} \frac{1}{2} & 0 \\ -\frac{1}{6} & \frac{1}{3} \end{bmatrix}$$

$$6. \begin{bmatrix} 1 & 7 \\ 2 & 6 \end{bmatrix}$$

$$7. \begin{bmatrix} \frac{1}{3} & 2 \\ \frac{3}{2} & 9 \end{bmatrix}$$

$$8. \begin{bmatrix} -1 & -1 \\ -1 & -1 \end{bmatrix}$$

$$9. \begin{bmatrix} 8 & 7 \\ 9 & 8 \end{bmatrix}$$

PLE 3

Write the matrix equation for the system, and solve.

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$$10. \begin{cases} 3x - y = 5 \\ y = 2x - 4 \end{cases}$$

$$11. \begin{cases} 5x + 9y = 1 \\ 2 - 4x - 7y = 4 \end{cases}$$

$$12. \begin{cases} 2x + 4y = 3 \\ 2x + 3y = 1 \end{cases}$$

PLE 4

280 13. **Cryptography** Rayanne receives the message shown, giving Sara's current location somewhere in Asia. The message was encoded using  $\begin{bmatrix} 3 & 4 \\ 5 & 7 \end{bmatrix}$ . Write the decoding matrix, and decode the message.

27 58 20 90 47 105  
45 98 35 154 81 178



SEND

## PRACTICE AND PROBLEM SOLVING

Determine whether the given matrices are inverses.

Practice

See  
example

1

2

3

4

AKS

p. S35

$$14. \begin{bmatrix} 0 & 1 \\ 1 & 1 \end{bmatrix} \begin{bmatrix} 0 & 1 \\ 1 & -1 \end{bmatrix}$$

$$15. \begin{bmatrix} -1 & \frac{1}{2} \\ \frac{1}{4} & -2 \end{bmatrix} \begin{bmatrix} -\frac{16}{15} & -\frac{4}{15} \\ -\frac{2}{15} & -\frac{8}{15} \end{bmatrix}$$

$$16. \begin{bmatrix} 1 & 5 & -1 \\ 1 & 0 & -1 \\ 1 & 0 & 0 \end{bmatrix} \begin{bmatrix} 0 & 0 & 1 \\ 0.2 & -0.2 & 0 \\ 0 & -1 & 1 \end{bmatrix}$$

Find the inverse of the matrix, if it is defined.

$$17. \begin{bmatrix} -0.25 & -0.5 \\ -1.5 & -2 \end{bmatrix}$$

$$18. \begin{bmatrix} 7 & 14 \\ 3 & 6 \end{bmatrix}$$

$$19. \begin{bmatrix} 2 & 3 \\ 5 & 8 \end{bmatrix}$$

$$20. \begin{bmatrix} 5 & 4 \\ 4 & 3 \end{bmatrix}$$

$$21. \begin{bmatrix} -2 & -3 \\ 7 & 11 \end{bmatrix}$$

Write the matrix equation for the system, and solve.

$$22. \begin{cases} x - y = 5 \\ 2y - x = 6 \end{cases}$$

$$23. \begin{cases} x + 2y = 6 \\ 2x + y = 9 \end{cases}$$

$$24. \begin{cases} 4x + 7y = 10 \\ 3x + 5y = 9 \end{cases}$$

25. **Cryptography** Quinn receives the coded message shown, which tells him when he needs to report to headquarters. It was encoded using the matrix  $\begin{bmatrix} 7 & 3 \\ 9 & 4 \end{bmatrix}$ . Write the decoding matrix, and decode the message. When will Quinn need to report?

91 120 101 82 43 250  
117 155 130 108 57 325



SEND