




3.8 EXERCISES

HOMEWORK KEY

-  = **WORKED-OUT SOLUTIONS**
on p. WS1 for Exs. 3, 25, and 47
-  = **TAKS PRACTICE AND REASONING**
Exs. 12, 34, 41, 46, 51, 52, and 53
-  = **MULTIPLE REPRESENTATIONS**
Ex. 45

SKILL PRACTICE

1. **VOCABULARY** Identify the matrix of variables and the matrix of constants in the matrix equation. $\begin{bmatrix} -1 & 2 \\ 3 & 4 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} = \begin{bmatrix} 4 \\ -2 \end{bmatrix}$

2. **WRITING** Explain how to find the inverse of a 2×2 matrix A where $\det A \neq 0$.

EXAMPLE 1


on p. 210
for Exs. 3–12

FINDING INVERSES Find the inverse of the matrix.

3. $\begin{bmatrix} 1 & -5 \\ -1 & 4 \end{bmatrix}$ 4. $\begin{bmatrix} -2 & 3 \\ -3 & 4 \end{bmatrix}$ 5. $\begin{bmatrix} 6 & 2 \\ 5 & 2 \end{bmatrix}$ 6. $\begin{bmatrix} -7 & -9 \\ 2 & 3 \end{bmatrix}$
7. $\begin{bmatrix} -4 & -6 \\ 4 & 7 \end{bmatrix}$ 8. $\begin{bmatrix} 6 & -22 \\ -12 & 20 \end{bmatrix}$ 9. $\begin{bmatrix} -24 & 60 \\ -6 & 30 \end{bmatrix}$ 10. $\begin{bmatrix} \frac{4}{3} & \frac{5}{6} \\ -4 & -1 \end{bmatrix}$

11. **ERROR ANALYSIS** Describe and correct the error in finding the inverse of the matrix $\begin{bmatrix} 2 & 4 \\ 1 & 5 \end{bmatrix}$.

$$\begin{bmatrix} 2 & 4 \\ 1 & 5 \end{bmatrix}^{-1} = 6 \begin{bmatrix} 5 & -4 \\ -1 & 2 \end{bmatrix} = \begin{bmatrix} 30 & -24 \\ -6 & 12 \end{bmatrix} \quad \times$$

12.  **TAKS REASONING** What is the inverse of the matrix $\begin{bmatrix} 10 & -3 \\ 3 & -1 \end{bmatrix}$?

- (A) $\begin{bmatrix} -10 & 3 \\ -3 & 1 \end{bmatrix}$ (B) $\begin{bmatrix} -1 & 3 \\ -3 & 10 \end{bmatrix}$ (C) $\begin{bmatrix} 1 & -3 \\ 3 & -10 \end{bmatrix}$ (D) $\begin{bmatrix} 10 & -3 \\ 3 & -1 \end{bmatrix}$

EXAMPLE 2

on p. 211
for Exs. 13–18

SOLVING EQUATIONS Solve the matrix equation.

13. $\begin{bmatrix} 1 & 1 \\ 4 & 5 \end{bmatrix} X = \begin{bmatrix} 2 & 3 \\ -1 & 6 \end{bmatrix}$ 14. $\begin{bmatrix} 6 & 8 \\ 2 & 3 \end{bmatrix} X = \begin{bmatrix} 4 & 3 \\ 0 & -2 \end{bmatrix}$ 15. $\begin{bmatrix} -1 & 0 \\ 6 & 4 \end{bmatrix} X = \begin{bmatrix} 3 & -1 \\ 4 & 5 \end{bmatrix}$
16. $\begin{bmatrix} -3 & 6 \\ 1 & 2 \end{bmatrix} X = \begin{bmatrix} 5 & -1 \\ 8 & 2 \end{bmatrix}$ 17. $\begin{bmatrix} 1 & 5 \\ 0 & -2 \end{bmatrix} X = \begin{bmatrix} 3 & -1 & 0 \\ 6 & 8 & 4 \end{bmatrix}$ 18. $\begin{bmatrix} -5 & 2 \\ -9 & 3 \end{bmatrix} X = \begin{bmatrix} 4 & 5 & 0 \\ 3 & 1 & 6 \end{bmatrix}$

EXAMPLE 3

on p. 211
for Exs. 19–24

FINDING INVERSES Use a graphing calculator to find the inverse of matrix A . Check the result by showing that $AA^{-1} = I$ and $A^{-1}A = I$.

19. $A = \begin{bmatrix} 1 & 1 & -2 \\ -2 & 0 & 3 \\ 3 & 1 & 0 \end{bmatrix}$ 20. $A = \begin{bmatrix} 1 & 0 & 2 \\ 2 & 1 & 3 \\ 1 & 4 & 4 \end{bmatrix}$ 21. $A = \begin{bmatrix} 1 & -1 & 2 \\ -2 & 3 & 10 \\ 3 & -1 & 2 \end{bmatrix}$
22. $A = \begin{bmatrix} -2 & 5 & -1 \\ 0 & 8 & 1 \\ 12 & -5 & 0 \end{bmatrix}$ 23. $A = \begin{bmatrix} 3 & -8 & 0 \\ 2 & 4 & 1 \\ -1 & 0 & -6 \end{bmatrix}$ 24. $A = \begin{bmatrix} 4 & 1 & 5 \\ -2 & 2 & 1 \\ 3 & -1 & 6 \end{bmatrix}$