Practice and Apply

For Exercises 12–23,

$$\text{let } A = \begin{bmatrix} 5 & 7 & -3 & 0 \\ -2 & 1 & 8 & 11 \end{bmatrix}, B = \begin{bmatrix} 8 & -5 & 2 \\ -1 & 4 & -2 \\ 0 & -5 & 3 \\ 5 & 7 & -6 \end{bmatrix}, \text{ and } C = \begin{bmatrix} 7 \\ 2 \\ 6 \end{bmatrix}.$$

Give the dimensions of each matrix.

12. A

13. B

14. C

Give the entry at the indicated address in matrix *A*, *B*, or *C*.

15. a_{23}

16. b_{12}

17. c_{31}

Find the indicated matrix.

18. $-A$

19. $-4C$

20. $-2B$

21. $-B$

22. $3A$

23. $\frac{1}{2}B$

Solve for x and y.

24. $\begin{bmatrix} 3 & 4y \\ 5 & 8 \end{bmatrix} = \begin{bmatrix} 3 & 2 \\ 2x-1 & 8 \end{bmatrix}$

25. $\begin{bmatrix} -6 & 5 \\ -1 & 0 \end{bmatrix} = \begin{bmatrix} y+12 & 5 \\ -1 & x+7 \end{bmatrix}$

26. $\begin{bmatrix} 18 & \frac{1}{24}x \\ -\frac{2}{9}y & 15 \end{bmatrix} = \begin{bmatrix} 2x+6 & \frac{1}{4} \\ \frac{2}{3} & -5y \end{bmatrix}$

27. $\begin{bmatrix} \frac{2}{3}x & 12 \\ -4 & \frac{1}{2}y+5 \end{bmatrix} = \begin{bmatrix} 6 & x+3 \\ -4 & y+1 \end{bmatrix}$

28. $\begin{bmatrix} 2.5x & 3y+5 \\ 4 & y \end{bmatrix} = \begin{bmatrix} -10 & 2 \\ -x & y \end{bmatrix}$

29. $\begin{bmatrix} 4.1x & x \\ -100 & -3.7y \end{bmatrix} = \begin{bmatrix} 16.4 & x \\ -25x & -11.1 \end{bmatrix}$

For Exercises 30–45, let $A = \begin{bmatrix} 7 & 3 & -1 & 5 \\ -2 & 8 & 0 & -4 \end{bmatrix}$ and $B = \begin{bmatrix} 6 & 0 & 11 & -3 \\ -5 & 2 & -8 & 9 \end{bmatrix}$.

Perform the indicated operations.

30. $A + B$

31. $A - B$

32. $2A$

33. $-3B$

34. $B - A$

35. $A + B - A$

36. $4(B - A)$

37. $(B + A) - (-A)$

38. $-(A - B)$

39. $2A - (-B - A)$

40. $-\left(\frac{1}{2}B - A\right)$

41. $-3(B + A) - A$

42. $-\frac{1}{2}A + (B - A)$

43. $3B + 2A$

44. $\frac{1}{4}(B - 2A)$

45. $4\left(\frac{1}{2}A + \frac{2}{3}A\right)$

46. Construct a 3×3 square matrix, A, where $a_{ij} = i^2 + 2j - 3$.

TRANSFORMATIONS **For Exercises 47–49, refer to the coordinate plane at left.**