NAME Key DATE PERIOD

4.1 Practice

Perform the indicated operations. If the matrix does not exist, write *impossible*.

1. $\begin{bmatrix} 2 & -1 \\ 3 & 7 \\ 14 & -9 \end{bmatrix} + \begin{bmatrix} -6 & 9 \\ 7 & -11 \\ -8 & 17 \end{bmatrix} = \begin{bmatrix} -4 & 8 \\ 10 & -4 \\ 6 & 8 \end{bmatrix}$

2. $\begin{bmatrix} 4 \\ -71 \\ 18 \end{bmatrix} - \begin{bmatrix} -67 \\ 45 \\ -24 \end{bmatrix} = \begin{bmatrix} 71 \\ -116 \\ 42 \end{bmatrix}$

3. $-3\begin{bmatrix} -1 & 0 \\ 17 & -11 \end{bmatrix} + 4\begin{bmatrix} -3 & 16 \\ -21 & 12 \end{bmatrix} = \begin{bmatrix} -9 & 64 \\ -135 & 81 \end{bmatrix}$

4. $7\begin{bmatrix} 2 & -1 & 8 \\ 4 & 7 & 9 \end{bmatrix} - 2\begin{bmatrix} -1 & 4 & -3 \\ 7 & 2 & -6 \end{bmatrix} = \begin{bmatrix} 16 & -15 & 62 \\ 14 & 45 & 75 \end{bmatrix}$

5. $-2\begin{bmatrix} 1 \\ 2 \end{bmatrix} + 4\begin{bmatrix} 0 \\ 5 \end{bmatrix} - \begin{bmatrix} 10 \\ 18 \end{bmatrix} = \begin{bmatrix} -12 \\ -2 \end{bmatrix}$

6. $\frac{3}{4}\begin{bmatrix} 8 & 12 \\ -16 & 20 \end{bmatrix} + \frac{2}{3}\begin{bmatrix} 27 & -9 \\ 54 & -18 \end{bmatrix} = \begin{bmatrix} 24 & 3 \\ 24 & 3 \end{bmatrix}$

Use matrices $A = \begin{bmatrix} 4 & -1 & 0 \\ -3 & 6 & 2 \end{bmatrix}$, $B = \begin{bmatrix} -2 & 4 & 5 \\ 1 & 0 & 9 \end{bmatrix}$, and $C = \begin{bmatrix} 10 & -8 & 6 \\ -6 & -4 & 20 \end{bmatrix}$ to find the following.

7. $A - B$ $\begin{bmatrix} 6 & -5 & -5 \\ -4 & 6 & -7 \end{bmatrix}$

8. $A - C$ $\begin{bmatrix} -6 & 7 & -6 \\ 3 & 10 & -18 \end{bmatrix}$

9. $-3B$ $\begin{bmatrix} 6 & -12 & -15 \\ -3 & 0 & -27 \end{bmatrix}$

10. $4B - A$ $\begin{bmatrix} -12 & 17 & 20 \\ 7 & -6 & 34 \end{bmatrix}$

11. $-2B - 3C$ $\begin{bmatrix} -26 & 16 & -28 \\ 16 & 12 & -78 \end{bmatrix}$

12. $A + 0.5C$ $\begin{bmatrix} 9 & -5 & 3 \\ -6 & 4 & 13 \end{bmatrix}$

13. **ECONOMICS** Use the table that shows loans by an economic development board to women and men starting new businesses.

	Women		Men	
	Businesses	Loan Amount ($)	Businesses	Loan Amount ($)
2003	27	$567,000	36	$864,000
2004	41	$902,000	32	$672,000
2005	35	$777,000	28	$562,000

a. Write two matrices that represent the number of new businesses and loan amounts, one for women and one for men.

$\begin{bmatrix} 27 & 567{,}000 \\ 41 & 902{,}000 \\ 35 & 777{,}000 \end{bmatrix}$ $\begin{bmatrix} 36 & 864{,}000 \\ 32 & 672{,}000 \\ 28 & 562{,}000 \end{bmatrix}$

b. Find the sum of the numbers of new businesses and loan amounts for both men and women over the three–year period expressed as a matrix.

$\begin{bmatrix} 63 & 1{,}431{,}000 \\ 73 & 1{,}574{,}000 \\ 63 & 1{,}339{,}000 \end{bmatrix}$

14. **PET NUTRITION** Use the table that gives nutritional information for two types of dog food. Find the difference in the percent of protein, fat, and fiber between Mix B and Mix A expressed as a matrix.

	% Protein	% Fat	% Fiber
Mix A	22	12	5
Mix B	24	8	8

$\begin{bmatrix} 2 & -4 & 3 \end{bmatrix}$