

## 3-6 Practice - *Multiplying Matrices*

Determine whether each matrix product is defined. If so, state the dimensions of the product.

1.  $A_{7 \times 4} \cdot B_{4 \times 3}$

2.  $A_{3 \times 5} \cdot M_{5 \times 8}$

3.  $M_{5 \times 8} \cdot A_{3 \times 5}$

Find each product, if possible.

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

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

6.  $\begin{bmatrix} 3 & -2 & 7 \\ 6 & 0 & -5 \end{bmatrix} \cdot \begin{bmatrix} 3 & -2 & 7 \\ 6 & 0 & -5 \end{bmatrix}$

7.  $[4 \ 0 \ 2] \cdot \begin{bmatrix} 1 \\ 3 \\ -1 \end{bmatrix}$

Use  $A = \begin{bmatrix} 1 & 3 \\ 3 & 1 \end{bmatrix}$ ,  $B = \begin{bmatrix} 4 & 0 \\ -2 & -1 \end{bmatrix}$ ,  $C = \begin{bmatrix} -1 & 0 \\ 0 & -1 \end{bmatrix}$ , and  $c = 3$  to find the given products.

8.  $AB$

9.  $BA$

10. Is  $AB = BA$  a true statement?

11.  $c(AB)$

Use  $W = \begin{bmatrix} 1 & -5 \\ 2 & 0 \end{bmatrix}$ ,  $H = \begin{bmatrix} -3 & 7 \\ 4 & -1 \end{bmatrix}$ ,  $S = \begin{bmatrix} -3 & 1 & 5 \\ 6 & 0 & 10 \end{bmatrix}$ , to find the given products.

12.  $W^2$

13.  $H^2$

14.  $S^2$

**15. RENTALS** For their one-week vacation, the Montoyas can rent a 2-bedroom condominium for \$1796, a 3-bedroom condominium for \$2165, or a 4-bedroom condominium for \$2538. The table shows the number of units in each of three complexes.

	2-Bedroom	3-Bedroom	4-Bedroom
Sun Haven	36	24	22
Surfside	29	32	42
Seabreeze	18	22	18

- Write a matrix that represents the number of each type of unit available at each complex and a matrix that represents the weekly charge for each type of unit.
- If all of the units in the three complexes are rented for the week at the rates given the Montoyas, express the income of each of the three complexes as a matrix.
- What is the total income of all three complexes for the week?