10-2 Additional Practice

Matrix Multiplication

1. A carpenter builds three boxes. One box uses 12 nails. The second box uses 6 nails and 6 screws. The third box uses 8 screws and 2 hinges. Nails cost $0.04 each, screws cost $0.06 each, and hinges cost $0.12 each.

a. Write a 3×3 matrix that represents the number of each type of hardware in each box.

b. Write a 3×1 matrix that represents the cost of each type of hardware.

c. Find the 3×1 matrix that represents the cost of hardware for each box.

For Items 2 and 3, determine whether each equation is true for the square matrices A, B, and C. Show your work.

$$A = \begin{bmatrix} 3 & 3 \\ 2 & 0 \end{bmatrix} \qquad B = \begin{bmatrix} -2 & 4 \\ -3 & 1 \end{bmatrix} \qquad C = \begin{bmatrix} 8 & -4 \\ 5 & 2 \end{bmatrix}$$

2. $(A + B)C = AC + BC$

3. $A(BC) = (AB)C$

4. Find IQ.

Let $I = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$ and $Q = \begin{bmatrix} 4 & -4 & 3 \\ 3 & 4 & -2 \\ -2 & 8 & 2 \end{bmatrix}$.

$IQ =$

5. Write a matrix that represents the coordinates of the triangle ABC after a reflection across the y-axis. Then show $A'B'C'$ on the graph.

$A'B'C' =$