10-1 Additional Practice

Operations with Matrices

1. In matrix D, the entries represent the number of students in clubs in a high school. Column 1 lists the males and column 2 lists the females. Row 1 lists the number of students in the Spanish club, and row 2 lists the number of students in the French club. Find d_{11}, d_{21} and d_{12} and tell what each number represents.

$$D = \begin{bmatrix} 46 & 39 \\ 62 & 12 \end{bmatrix}$$

2. For matrix P, the rows represent the price of sweaters and pants. The columns represent the color scheme of black, blue and khaki. A black sweater costs $\$45$, a blue sweater costs $\$60$, and a khaki sweater costs $\$25$. The black pants cost $\$30$, the blue pants cost $\$40$, and the khaki pants cost $\$20$.

a. Write matrix P to represent this scenario.

b. The store is having a 35% off sale. Find the reduced price of each type of sweater and pants and write a new matrix that represents the sale prices.

For Items 3–5, find the sum or difference, if possible. If not possible, explain why.

$$P = \begin{bmatrix} 0 & 2 & 4 \\ 9 & 8 & 2 \end{bmatrix} \qquad Q = \begin{bmatrix} -2 & -4 & 1 \\ 9 & 7 & 0 \end{bmatrix} \qquad R = \begin{bmatrix} 4 & -1 & 0 \\ 2 & 3 & 5 \\ 0 & -6 & 1 \end{bmatrix}$$

3. $P + Q =$

4. $Q - P =$

5. $Q + R =$

6. Find the additive inverse of the matrix $X = \begin{bmatrix} 2 & -5 \\ -6 & 3 \end{bmatrix}$.

7. $\overline{EF}$ has endpoints (2, 4) and (4, 5).

a. Use matrices to translate $\overline{EF}$ 2 units right and 4 units down to $\overline{YZ}$. What are the coordinates of Y and Z?

b. Use matrices to dilate $\overline{EF}$ to $\overline{UV}$ by a scale factor of 4, centered at the origin. What are the coordinates of U and V?