

Practice 4-2

Adding and Subtracting Matrices

Find the value of each variable.

$$1. \begin{bmatrix} a & 2b \\ c-2 & d+3 \end{bmatrix} = \begin{bmatrix} 5 & -7 \\ 10 & 10 \end{bmatrix}$$

$$2. \begin{bmatrix} 3 & 5 & -y & x \\ z & 0 & 3a & b \end{bmatrix} = \begin{bmatrix} 3 & 3c & 7 & 4 \\ \frac{7}{2} & 0 & -9 & 3b \end{bmatrix}$$

$$3. \begin{bmatrix} 5 & 1 \\ 0 & 2 \end{bmatrix} + \begin{bmatrix} 2 & -13 \\ -10 & -10 \end{bmatrix} = \begin{bmatrix} 2x+1 & -4x \\ 5z & 2.5z-x \end{bmatrix}$$

Use the information in the table.

- Put the data in two matrices: one for males and one for females.
- Use matrix subtraction to find the difference between the number of males and the number of females in each club each year.

Club Membership at TC High School

	1961–1962		2001–2002	
	Males	Females	Males	Females
Beta	37	23	56	58
Spanish	0	93	76	82
Chess	87	0	102	34
Library	6	18	27	29

Find each sum or difference.

$$6. \begin{bmatrix} -1 & 2 \\ 3 & -1 \end{bmatrix} + \begin{bmatrix} -1 & 2 \\ -3 & 1 \end{bmatrix} + \begin{bmatrix} 0 & -1 \\ 2 & 0 \end{bmatrix}$$

$$7. \begin{bmatrix} 8 & -5 & -5 \\ 4 & -10 & 10 \\ 2 & -15 & -15 \end{bmatrix} - \begin{bmatrix} 0 & 0 & 1 \\ 1 & -2 & -2 \\ -2 & -3 & 3 \end{bmatrix}$$

$$8. \begin{bmatrix} -2 & -1 \\ -3 & 1 \\ -1 & -1 \end{bmatrix} - \begin{bmatrix} -2 & -2 \\ 3 & -1 \\ 0 & -2 \end{bmatrix} + \begin{bmatrix} -2 & 1 \\ 0 & 3 \\ -3 & -3 \end{bmatrix}$$

$$9. \begin{bmatrix} 1 \\ 1 \\ 1 \end{bmatrix} + \begin{bmatrix} -1 \\ -3 \\ 5 \end{bmatrix} + \begin{bmatrix} -10 \\ -7 \\ 11 \end{bmatrix} - \begin{bmatrix} -3 \\ -5 \\ -6 \end{bmatrix}$$

Solve each matrix equation.

$$10. X - \begin{bmatrix} 3 & 4 \\ 4 & 2 \\ 1 & 9 \end{bmatrix} = \begin{bmatrix} 5 & 7 \\ 9 & 12 \\ 3 & 2 \end{bmatrix}$$

$$11. X + \begin{bmatrix} 20 & -9 & -3 \\ 19 & -2 & -5 \\ -1 & 0 & -8 \end{bmatrix} = \begin{bmatrix} -7 & 92 & -5 \\ 0 & 91 & -6 \\ -9 & -1 & 12 \end{bmatrix}$$

$$12. \begin{bmatrix} -2 & -3 \\ 2 & 2 \end{bmatrix} = X - \begin{bmatrix} 1 & -1 \\ -2 & 2 \end{bmatrix}$$

$$13. \begin{bmatrix} 2 & 2 & 0 \\ 1 & -1 & -1 \end{bmatrix} = \begin{bmatrix} 2 & -2 & 3 \\ -3 & -3 & 4 \end{bmatrix} - X$$

Determine whether the two matrices in each pair are equal.

Justify your reasoning.

$$14. \begin{bmatrix} 2 \\ \sqrt{9} \\ 16 \end{bmatrix}; \begin{bmatrix} \frac{4}{2} & 3 & 4^2 \end{bmatrix}$$

$$15. \begin{bmatrix} 2(3) & 3(1.5) \\ 7 & \frac{10}{2} \end{bmatrix}; \begin{bmatrix} 6 & 4.5 \\ 7 & 5 \end{bmatrix}$$

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