

6.2 Matrices and Row Operations

Section 1: Write the augmented matrix of the given systems.

$$\begin{aligned} 1. \quad & 2x - 3y + 4z = 1 \\ & x + 2y - 6z = 0 \\ & 3x - 7y + 4z = -3 \end{aligned}$$

$$\begin{aligned} 2. \quad & x - \frac{1}{2}y + \frac{7}{4}z = 0 \\ & 2x - \frac{3}{2}y + 5z = 0 \\ & -2y + \frac{1}{3}z = 0 \end{aligned}$$

Section 2: Express the system in equation notation.

$$3. \quad \left(\begin{array}{ccc|c} 2 & -3 & 1 & 1 \\ 4 & 7 & 2 & 2 \end{array} \right)$$

$$4. \quad \left(\begin{array}{cccc|c} 1 & 0 & 1 & 0 & 1 \\ 1 & -1 & 4 & -2 & 3 \\ 4 & 2 & 5 & 0 & 2 \end{array} \right)$$

Section 3: The RREF of a matrix is given. Find the solutions of the system or determine if there is no solution.

$$5. \quad \left(\begin{array}{cccc|c} 1 & 0 & 0 & 1 & 2 \\ 0 & 1 & 0 & 2 & -3 \\ 0 & 0 & 1 & 0 & 4 \\ 0 & 0 & 0 & 0 & 0 \end{array} \right)$$

$$6. \quad \left(\begin{array}{cccc|c} 1 & 0 & 0 & 1 & 2 \\ 0 & 1 & 0 & 2 & -3 \\ 0 & 0 & 1 & 0 & 4 \\ 0 & 0 & 0 & 0 & 0 \end{array} \right)$$

Section 4: Use Gauss-Jordan elimination to solve the given system.

$$\begin{aligned} 7. \quad & -x + 3y + 2z = 0 \\ & -2x - 3y - 2z = 3 \\ & x + 2y + 3z = 0 \end{aligned}$$

$$\begin{aligned} 8. \quad & x + 2y + 2z = 1 \\ & x - 2y + 2z = 4 \\ & 2x - 2y + 3z = 5 \end{aligned}$$

$$\begin{aligned} 9. \quad & x - 2y + 4z = 6 \\ & x + y + 13z = 6 \\ & -2x + 6y - z = -10 \end{aligned}$$

$$\begin{aligned} 10. \quad & x + y + z = 200 \\ & x - 2y + 2z = 0 \\ & 2x + 3y + 5z = 600 \\ & 2x - y + z = 200 \end{aligned}$$

$$\begin{aligned} 11. \quad & 11x + 10y + 9z = 5 \\ & x + 2y + 3z = 1 \\ & 3x + 2y + z = 1 \end{aligned}$$

$$\begin{aligned} 12. \quad & x + y = 3 \\ & 5x - y = 3 \\ & 9x - 4y = 1 \end{aligned}$$

13. A collection of nickels, dimes, and quarters totals \$8.20. The number of nickels and dimes together is twice the number of quarters. The value of the nickels is one-third the value of the dimes. How many of each kind of coin are in the collection?

14. Lillian borrows \$10,000. She borrows some from her friend Ferige at 8% annual interest, twice as much as that from her bank at 9%, and the remainder from her insurance company 5%. She pays a total of \$830 in interest for the first year. How much did she borrow from each source?

15. Tickets to a local concert cost \$2 for children, \$3 for teenagers, and \$5 for adults. When 570 people attend the concert, the total ticket receipts were \$1950. Three-fourths as many teenagers as children attended. How many children, teenagers, and adults attended the concert?