7.3.1: Systems of Linear Equations – Special Cases (Exercises)

SECTION 7.3 PROBLEM SET: SYSTEMS OF LINEAR EQUATIONS - SPECIAL CASES

Solve the following inconsistent or dependent systems by using the Gauss-Jordan method.

1. $\begin{aligned} 2x+6y &= 8 \\ x+3y &= 4 \end{aligned}$	2. The sum of digits of a two digit number is 9. The sum of the number and the number obtained by interchanging the digits is 99. Find the number.
3. $\begin{aligned} 2x-y &= 10 \\ -4x+2y &= 15 \end{aligned}$	4. $\begin{aligned} x+y+z &= 6 \\ 3x+2y+z &= 14 \\ 4x+3y+2z &= 20 \end{aligned}$
5. $\begin{aligned} x+2y-4z &= 1 \\ 2x-3y+8z &= 9 \end{aligned}$	6. Jessica has a collection of 15 coins consisting of nickels, dimes and quarters. If the total worth of the coins is \$1.80, how many are there of each? Find all three solutions.

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Solve the following inconsistent or dependent systems by using the Gauss-Jordan method.

7. A company is analyzing sales reports for three products: products X, Y, Z. One report shows that a combined total of 20,000 of items X, Y, and Z were sold. Another report shows that the sum of the number of item Z sold and twice the number of item X sold equals 10,000. Also item X has 5,000 more items sold than item Y. Are these reports consistent?	8. $\begin{aligned} x+y+2z &= 0 \\ x+2y+z &= 0 \\ 2x+3y+3z &= 0 \end{aligned}$
9. Find three solutions to the following system of equations. $\begin{aligned} x+2y+z &= 12 \\ y &= 3 \end{aligned}$	10. $\begin{aligned} x+2y &= 5 \\ 2x+4y &= k \end{aligned}$ For what values of k does this system of equations have a. No solution? b. Infinitely many solutions?
11. $x+3y-z=5$	12. Why is it not possible for a linear system to have exactly two solutions? Explain geometrically.