WS- Matrix Review
Analysis CP

Solve each system of equations. Give the unique solution; or write "no solution" or "infinitely many solutions." If there are infinitely many solutions, write the possible solutions in parametric form and give one specific solution.

1.
$$x - 2y + z = 7$$
$$3x + y - z = 2$$
$$2x + 3y + 2z = 7$$

2.
$$x + 2y - 2z = 8$$
$$-2x + y + 3z = -2$$
$$5y - z = 6$$

3.
$$2x - y + z = 6$$
$$3x - y + z = 6$$
$$4x - 2y + 2z = 12$$

4. Four landscapers want to purchase three types of trees. The trees are available at three different nurseries.
   a. George wishes to purchase 18 Spruce, 35 Pine and 75 Birch. Wally wishes to purchase 75 Spruce, 50 Pine and 15 Birch. Chuck wants 25 Spruce, 15 Pine and 14 Birch, and Marty wishes to purchase 45 Spruce, 50 Pine and 32 Birch. Display this information in a 4 x 3 matrix.
   b. Nursery A sells Spruce saplings for $1.25, Pine for $1.50, and Birch for $1.55. Nursery B sells Spruce saplings for $1.40, Pine for $1.45, and Birch for $1.50. Nursery C sells Spruce saplings for $1.35, Pine for $1.30, and Birch for $1.60. Display this information in a 3 x 3 matrix.
   c. Use matrix multiplication to determine which nursery offers the best overall deal for each of the four landscapers.

For each problem, define the variables and write a system of equations. If there is one solution, give it. If not, give the parametric formulas for the solutions, state the domain, and give one specific solution.

5. One group of customers bought 8 deluxe hamburgers, 6 orders of large fries, and 6 large colas for $26.10. A second group of customers ordered 10 deluxe hamburgers, 6 orders of large fries, and 8 large colas for $31.60. Determine the price of each food item.
6. To the information given in #4, add a third group that purchased 3 deluxe hamburgers, 2 orders of large fries, and 4 large colas for $10.95. Determine the price of each item.

Selected answers: 1. (2, -1, 3) 2. No solution 3. $(0, t - 6, t)$ 4. Nursery B for George, Nursery C for Wally, Nursery A for Chuck and Nursery C for Marty. 5. $\left(-t + 2.75, \ \frac{1}{3}t + \frac{41}{60}, \ t \right)$ 6. (1.95, 0.95, 0.80)