

Directions: a) Assign variables to the unknowns. b) Write a system of equations. c) Write an augmented matrix. d) Write the augmented matrix in reduced row echelon form. e) Write your results using a complete sentence using correct units.

1. A fruit grower uses two types of fertilizer in an orange grove, brand A and brand B. Each bag of brand A contains 8 pounds of nitrogen and 4 pounds of phosphoric acid. Each bag of brand B contains 7 pounds of nitrogen and 6 pounds of phosphoric acid. The orange grove needs 720 pounds of nitrogen and 500 pounds of phosphoric acid. How many bags of each brand should be used to meet these requirements?
2. A small manufacturing plant makes three types of inflatable boats: one-person, two-person, and four-person models. Each boat requires the services of three departments, as listed in the table. The cutting, assembly and packaging departments have available a maximum of 380, 330 and 120 labor-hours per week respectively. How many boats of each type must be produced each week for the plant to operate at full capacity?

Department	One-Person Boat	Two-Person Boat	Four-Person Boat
Cutting	0.5 hr	1.0 hr	1.5 hr
Assembly	0.6 hr	0.9 hr	1.2 hr
Packaging	0.2 hr	0.3 hr	0.5 hr

3. A dietitian in a hospital is to arrange a special diet compose of three basic foods. The diet is to include exactly 340 units of calcium, 180 units of iron, and 220 units of vitamin A. The number of units per ounce of each nutrient contained in each of the foods is indicated in the table. How many ounces of each food must be used to meet the dietary requirements?

Nutrient	Food A Units per Ounce	Food B Units per Ounce	Food C Units per Ounce
Calcium	30	10	20
Iron	10	10	20
Vitamin A	10	30	20

4. An outdoor amphitheater has 25,000 seats. Ticket prices are \$8, \$12 and \$20, and the number of \$8 tickets sold must equal the number of \$20 tickets sold. How many of each type of ticket must be sold in order to have a return of \$320,000?
5. A farmer wants to use two brands of fertilizer for his corn crop. Brand A contains 20% nitrogen and 3% phosphate. Brand B contains 16% nitrogen and 8% phosphate. How many pounds of each brand of fertilizer should be used if the farmer's corn crop needs 132 pounds of nitrogen and 31 pounds of phosphate?
6. An automobile dealer sold 220 sedans and 170 minivans last year. For this dealer, Plant A produces 10 sedans and 8 minivans per week and Plant B produces 8 sedans and 6 minivans per week. How many weeks did each plant operate in order to produce the 220 sedans and 170 minivans sold by the dealer?