Math 199
Summer II 2006 Name:
Systems of Linear Equations

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1. Solve the following systems of linear equations:

   (a)
   $$x - 2y = 5$$
   $$2x + y = 3$$

   (b)
   $$2x + 3y = 15$$
   $$8x + 12y = 40$$

   (c)
   $$3x - 2y = 4$$
   $$6x - 4y = 8$$

   (d)
   $$9x - 5y = 1$$
   $$-18x + 10y = 1$$

   (e)
   $$\frac{x}{2} + \frac{y}{3} = 8$$
   $$\frac{2x}{3} + \frac{3y}{2} = 17$$

   (f)
   $$x + 2y = 0$$
   $$y - x = 2$$
   $$x + y + z = -2$$

   (g)
   $$x + 2y + 3z = 8$$
   $$3x - y + 2z = 5$$
   $$-2x - 4y - 6z = 5$$

   (h)
   $$x + 2y + 4z = 6$$
   $$y + z = 1$$
   $$x + 3y + 5z = 10$$

2. A knitting shop ordered yarn from three suppliers, I, II, and III. One month the shop ordered a total of 100 units of yarn from these suppliers. The delivery costs were \$80, \$50, and \$65 per unit, respectively, with total delivery costs of \$5990. The shop ordered the same amount from suppliers I and III. how many units were ordered from each supplier?

3. An electronics company produces transistors, resistors, and computer chips. Each transistor requires 3 units of copper, 1 unit of zinc, and 2 units of glass. Each resistor requires 3, 2, and 1 units of the three materials, and each computer chip requires 2, 1, and 2 units of these materials, respectively. How many of each product can be made with 810 units of copper, 410 units of zinc, and 490 units of glass?

4. An auto manufacturer sends cars from two plants, I and II, to dealerships A and B located in a midwesterner city. Plant I has a total of 28 cars to send, and plant II has 8. Dealer A needs 20 cars, and dealer B needs 16. Transportation costs based on the distance of each dealership from each plant are \$220 from I to A, \$300 from I to B, \$400 from II to A, and \$180 from II to B. The manufacturer wants to limit transportation costs to \$10,640. How many cars should be sent from each plant to each of the two dealerships?