CSC 135
Assignment #3
Point value: 20

Program due: Sec 1 Mon, Sept 25
Sec 2 Tues, Sept 26

Given the equations shown below, the values of x and y can be found using Cramer's Rule.

$$ax + by = c$$
$$dx + ey = f$$

Cramer's Rule says that determinants can be used to calculate x and y as follows:

$$x = \frac{\begin{vmatrix} c & b \\ f & e \end{vmatrix}}{\begin{vmatrix} a & b \\ d & e \end{vmatrix}} \qquad y = \frac{\begin{vmatrix} a & c \\ d & f \end{vmatrix}}{\begin{vmatrix} a & b \\ d & e \end{vmatrix}}$$

To calculate the determinant of a 2 x 2 matrix, cross multiply and subtract the products. For example: the determinant of $\begin{vmatrix} 5 & 6 \\ 3 & 6 \end{vmatrix}$ is (5 * 6 - 3 * 6) = 12

Write an interactive C++ program that uses Cramer's Rule to solve a pair of linear equations. The program should prompt for two sets of data. The first set of data will consist of 3 integers, respectively a, b, and c. These numbers will be entered on the same line, separated by at least one blank space. The second set of data will be entered in the same format and represent d, e, and f.

As output for the program, print the two equations and then the values of x and y with appropriate labels. The input values will be integer and should be printed as such. The values of x and y will be floating point and should be printed with 3 digits to the right of the decimal. Using a, b, c, ... and x and y as variable names in this program is acceptable.

Example: if the input values are 1 2 5
2 -1 0
then the output should look something like--

Given the equations:
1x + 2y = 5
2x + -1y = 0
x = 1.000
y = 2.000

Test your program three times with the following data sets:

1. 4 -1 4
   2 2 17
2. 5 4 -10
   -3 8 19
3. 9 16 -1
   15 64 3

MINIMUM PROGRAM DOCUMENTATION REQUIRED.

DESIGN DOCUMENT

Before writing this program, create a design document that illustrates the algorithm your program will use. This document should provide enough detail so that another programmer could translate your algorithm into a working program. (3 points)