MAC 1140
LA session

Week 11

1. Solve the following systems using substitution or elimination

a) $\begin{cases} 2x+y=2 \\ 3x+2y=6 \end{cases}$

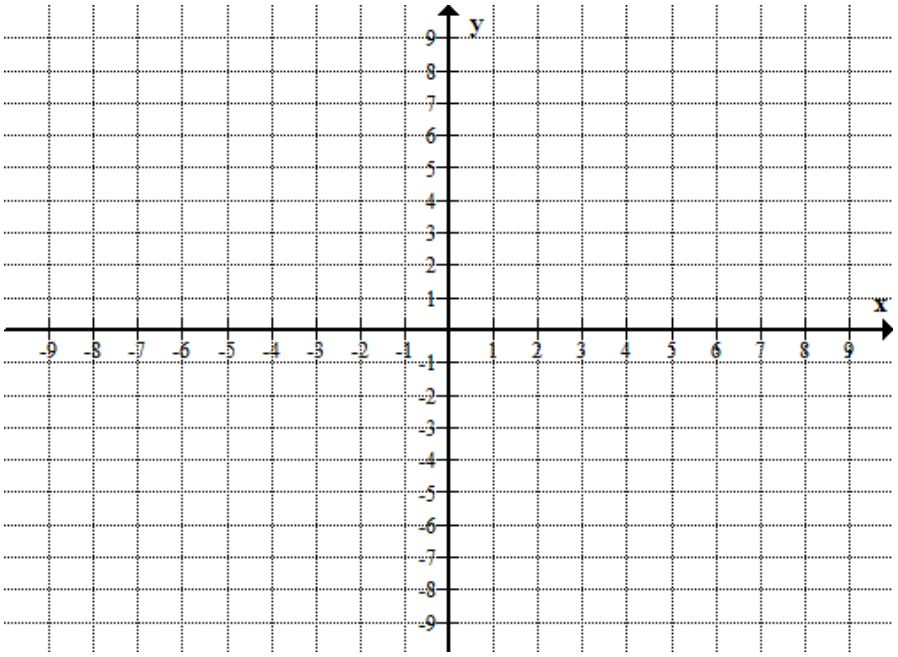
b) $\begin{cases} x^2-y^2=-5 \\ 2x+y=1 \end{cases}$

c) $\begin{cases} y-2z=0 \\ 2x+3y=2 \\ -x-2y+z=-1 \end{cases}$

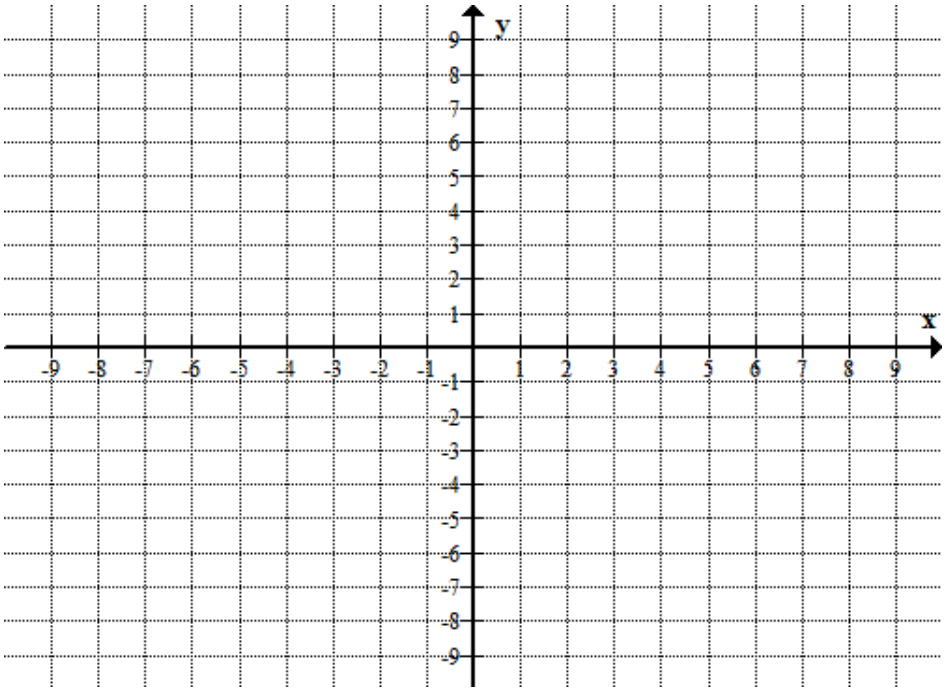
d) $\begin{cases} 2x^2-xy+y^2=8 \\ xy=4 \end{cases}$

2. Determine the number of solutions of the given system by graphing the equations. Do not solve.

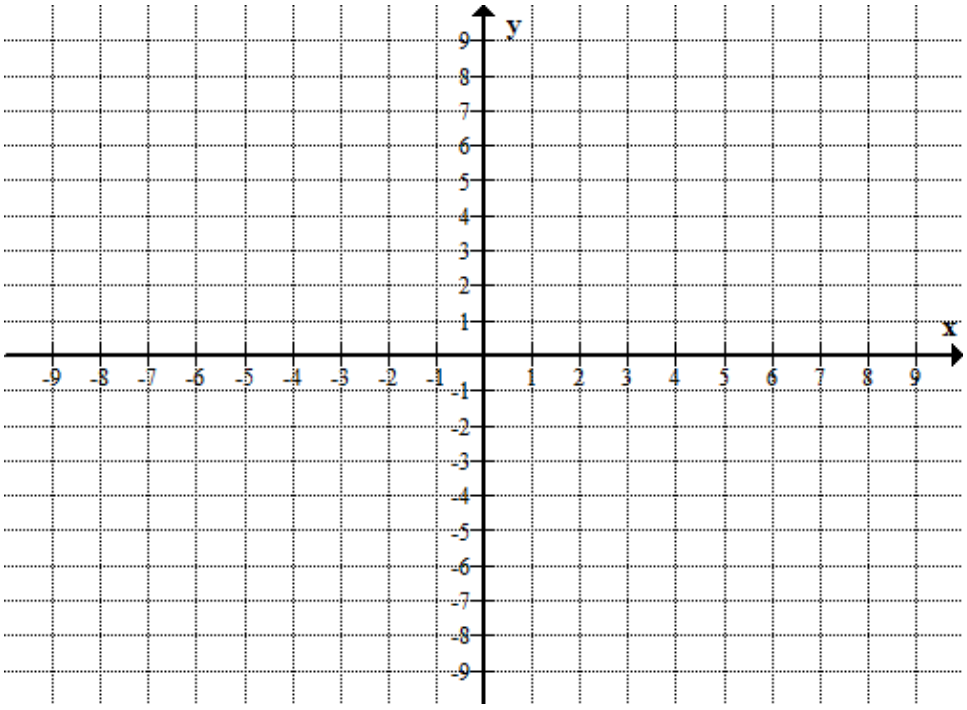
a) $\begin{cases} x^2+y^2=9 \\ \dfrac{x^2}{4}+\dfrac{y^2}{25}=1 \end{cases}$



b) $\begin{cases} \frac{y^2}{16} - \frac{x^2}{9} = 1 \\ \frac{x^2}{9} + \frac{y^2}{4} = 1 \end{cases}$



c) $\begin{cases} 2x - y = 0 \\ y^2 - 8x - 16 = 0 \end{cases}$



3. Compute the following determinants

a) $\begin{vmatrix} 3 & 4 \\ -1 & 5 \end{vmatrix}$

b) $\begin{vmatrix} 1 & -2 & 1 \\ 2 & 4 & 0 \\ -3 & 5 & -2 \end{vmatrix}$

4. Solve the following systems using Cramer's rule, if possible. If Cramer's rule cannot be applied then determine whether there are no solutions or infinitely many solutions. If the latter, write the solution set.

a) $\begin{cases} x - 2y + 3z = 1 \\ x + 2y - z = 13 \\ 3x + 2y - 5z = 3 \end{cases}$

b) $\begin{cases} x + 2y + z = 1 \\ 2x + 3y + 3z = 2 \\ x + 4y - z = -2 \end{cases}$

c) $\begin{cases} x - 2y + 2z = -3 \\ 2x + y - 3z = 4 \\ 3x - y - z = 1 \end{cases}$

5. A rectangular piece of cardboard, whose area is 216 cm^2, is made into an open box by cutting a 2cm squares from each corner and turning up the sides. If the box is to have a volume of 224 cm^3, what size cardboard should we start with?