

## How Do We Solve A Linear-Quadratic System By Graphing?

When a parabola and a line are drawn on the same set of axes, the points of intersection, if any, represent the solution set to the system of equations used to graph the parabola and the line.

### Graphic Solution

To obtain a graphic solution of a linear-quadratic system:

1. On the same set of axes, graph the linear equation and the quadratic equation.
2. From the graph, read the coordinates of the points of intersection.
3. Check the solution set in each of the two original equations.

For a linear-quadratic system, it is possible that the graphs intersect in:

2 points



1 point



no points

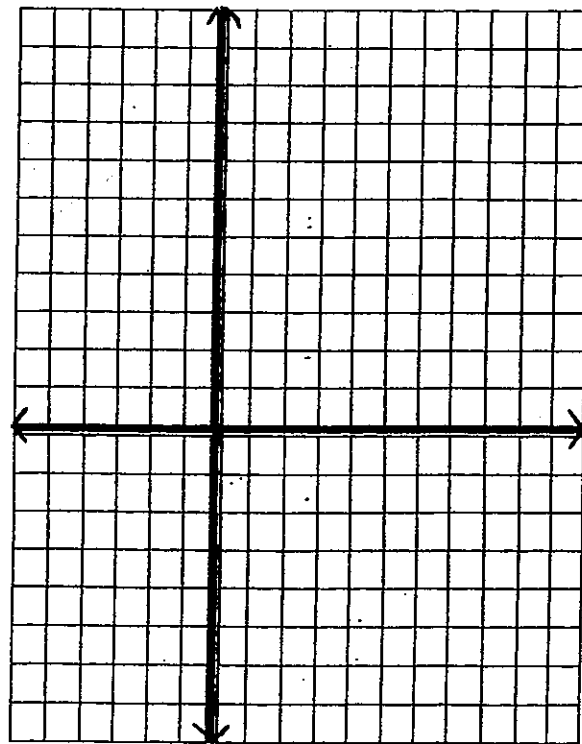


### Examples:

1) (a) Solve the following systems of equations graphically.

$$y = x^2 - 6x + 6$$

$$y = x - 4$$

\*prt 2 equations into  $y_1$  +  $y_2$  1st, then:

Check on calc: ① use the table: **2nd** **Graph**

and look for  $y_1$  +  $y_2$  to be the same #

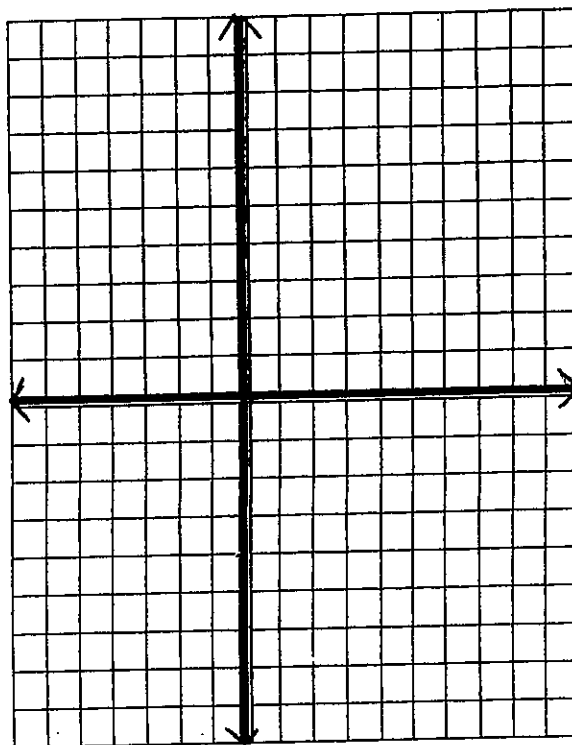
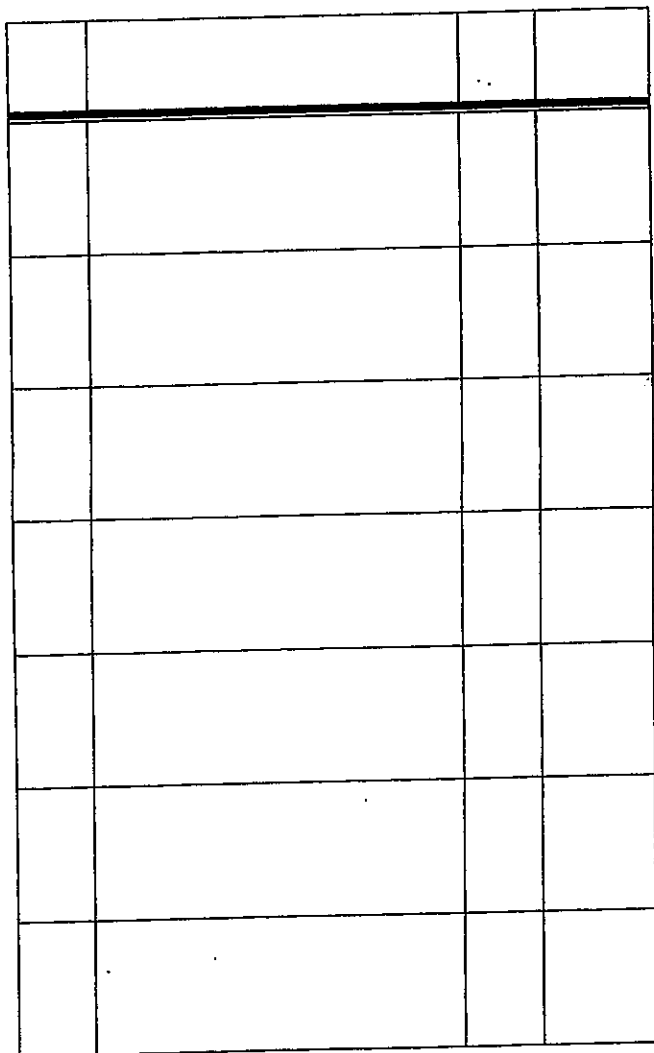
② intersect: **2nd** **Trace** **5: intersect** **enter** x3

and then repeat to find the 2nd point

- 2) (a) Draw the graph of  $y = -x^2 + 4x - 3$  for all values of  $x$  such that  $-1 \leq x \leq 5$ .  
 (b) On the same set of axes, draw the graph of  $x + y = 1$ .  
 (c) Determine the solution set of the system

$$y = -x^2 + 4x - 3$$

$$x + y = 1$$



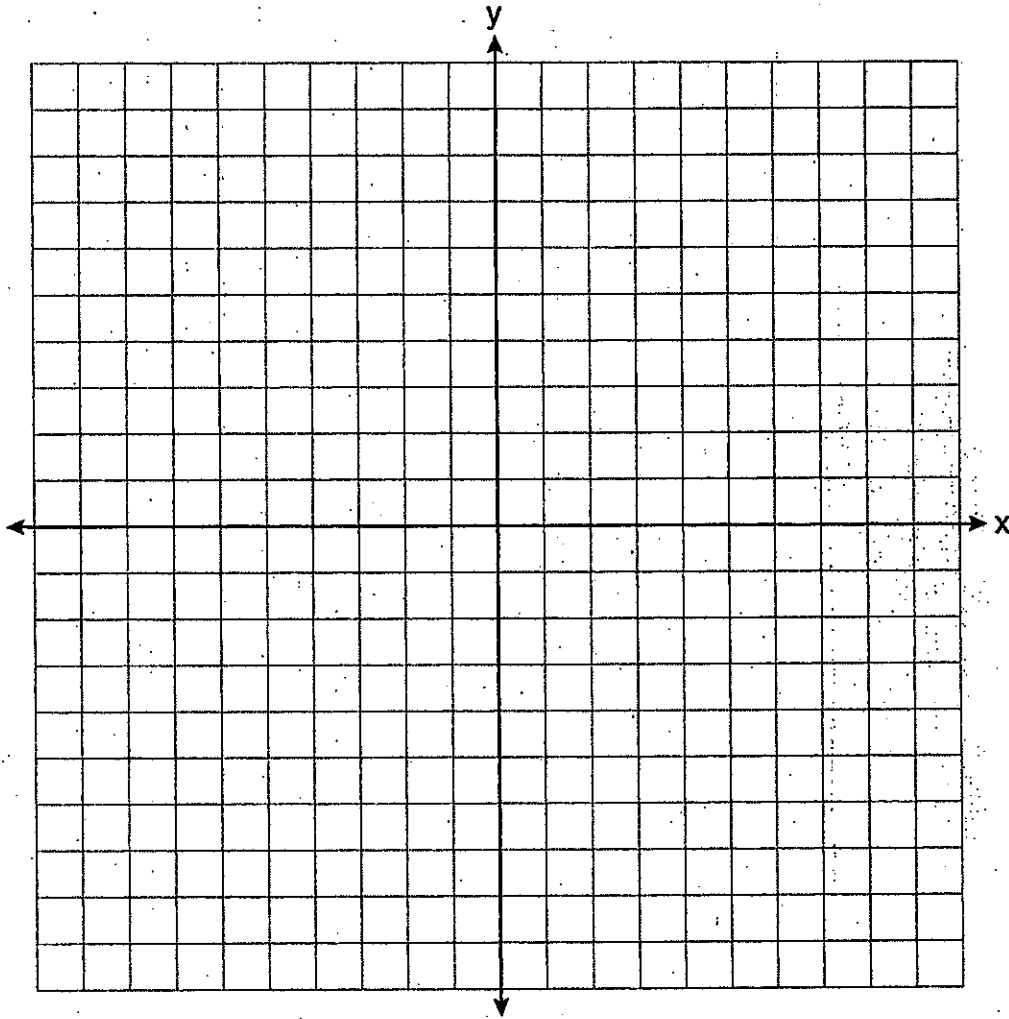
**Solution Set:** \_\_\_\_\_

Check

3) On the set of axes below, solve the following system of equations graphically for all values of  $x$  and  $y$ .

$$y = x^2 - 6x + 1$$

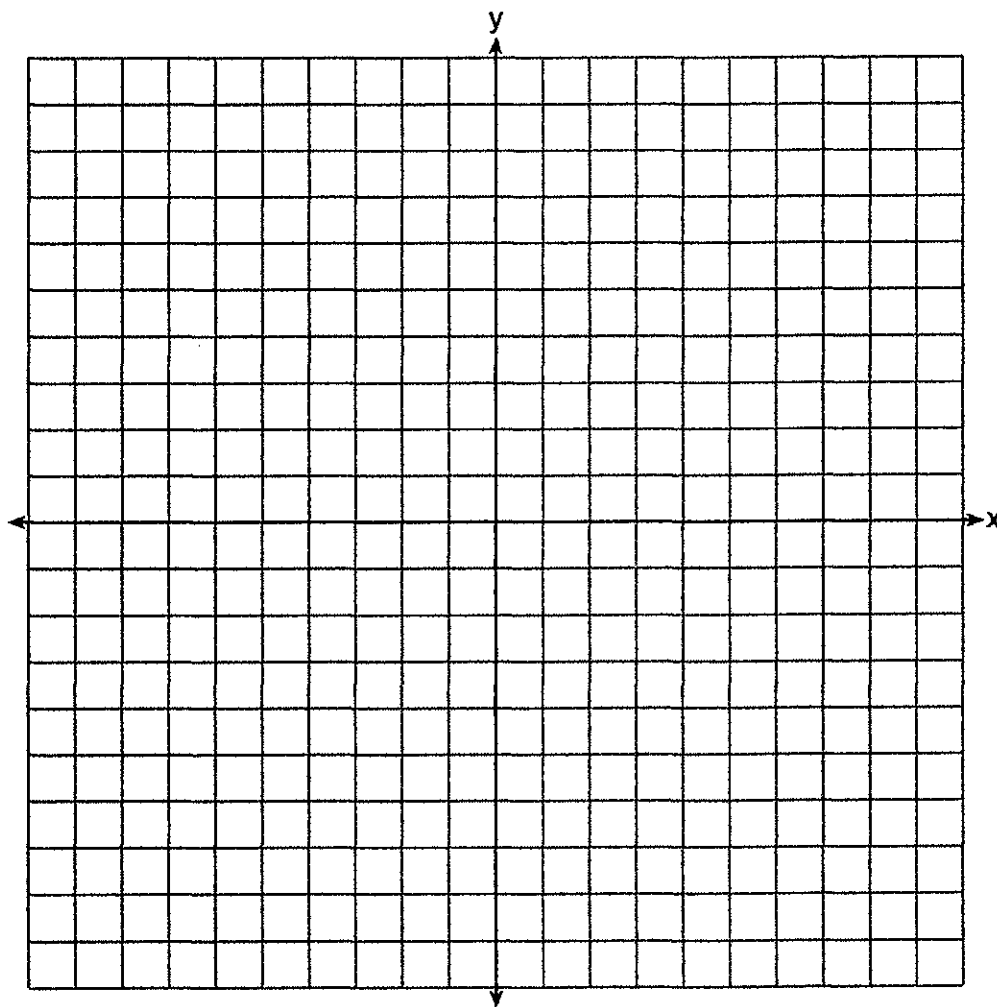
$$y + 2x = 6$$



4) On the set of axes below, graph the following system of equations.

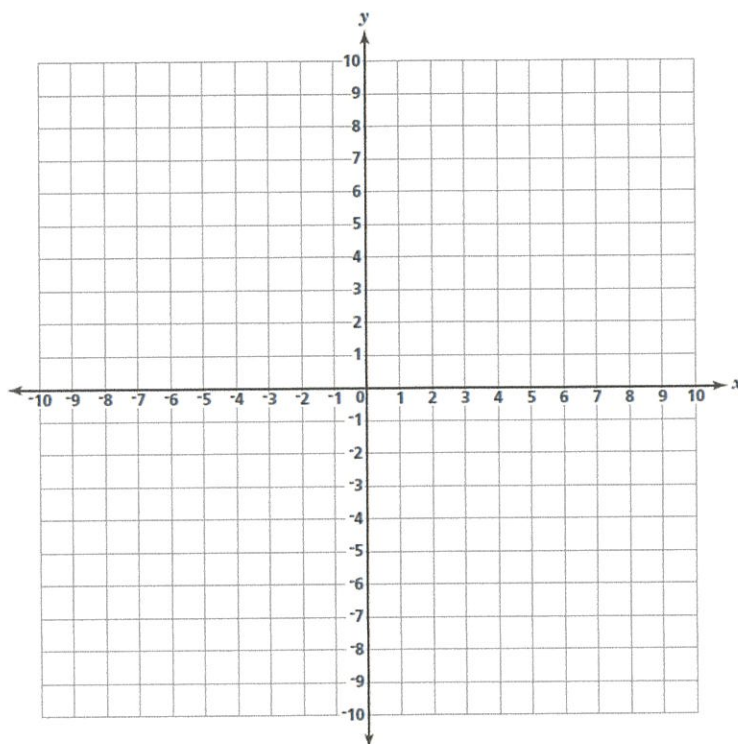
$$\begin{aligned}y + 2x &= x^2 + 4 \\ y - x &= 4\end{aligned}$$

Using the graph, determine and state the coordinates of *all* points in the solution set for the system of equations.



Solve the following system of equations graphically:

1)  $y = |x - 5|$   
 $y = 3$



2)  $y = 3|x - 2| + 1$   
 $y = 7$

