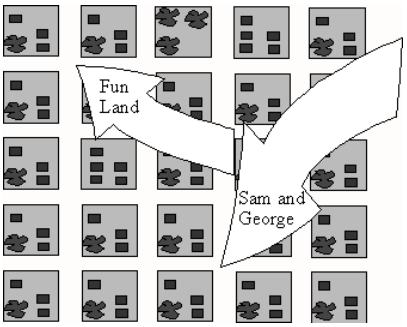
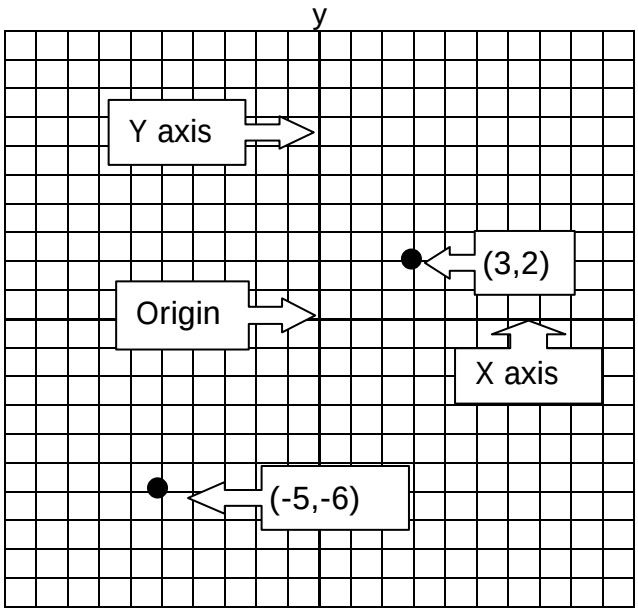
5-1 Cartesian Coordinate System

Sam: "How do I get to Fun Land?"
George: "Go two blocks west, then three blocks north."
To find Fun Land, Sam needs the distance in each of two directions.



The Cartesian Coordinate System is a way of tell where points are located. Just like Sam and George had to have a common point of reference, where they were both standing, the coordinate system has a common starting point called the origin.



The horizontal dark line is the **x axis**. The vertical dark line is the **y axis**.

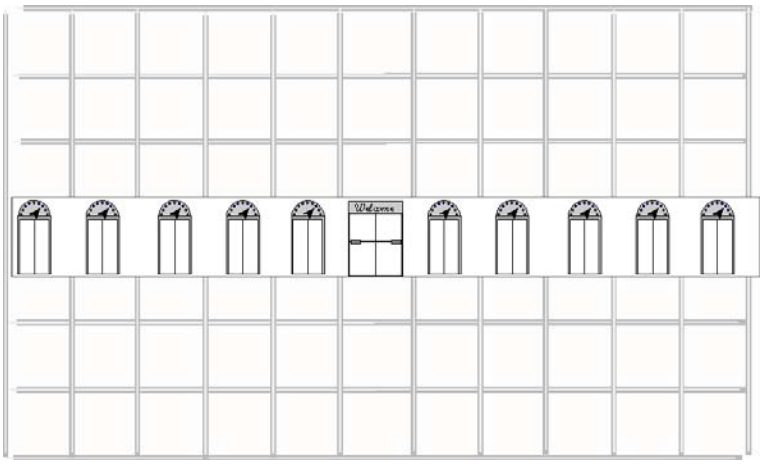
Where the x and y axis cross is the **origin**.

A pair of numbers is needed to tell where a specific point lies. (3,2) indicates a point that is 3 places to the right of the origin and two spaces up from the origin.
These numbers are called an **ordered pair.**

You have seen horizontal number lines. Think of this as a vertical number line centered on a horizontal number line.

The point (-5,-6) is five space left of the origin and six spaces below the origin.

I have found some students get the order mixed up when plotting points. One memory strategy is x first then y, is in alphabetical order.

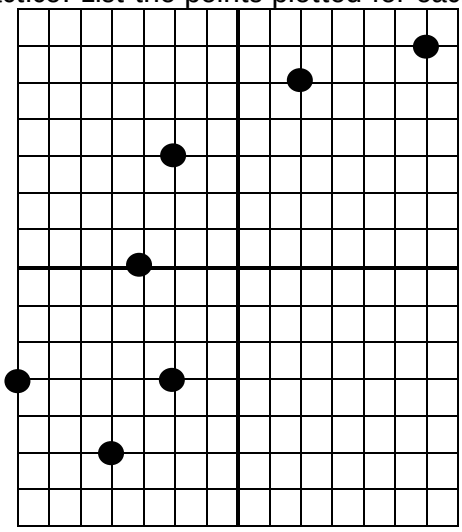


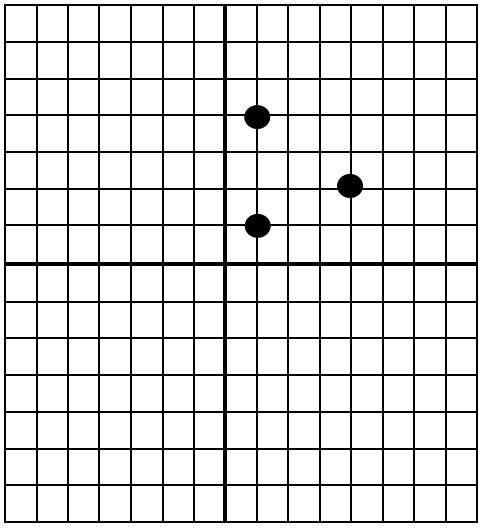
Another is to imagine a building with many stories and many basements. Each department on each floor has an elevator door and can only be accessed by that elevator. Someone must come in the front door (origin), then choose an elevator, then go up or down to the department they want.

The horizontal is done first, then the vertical.

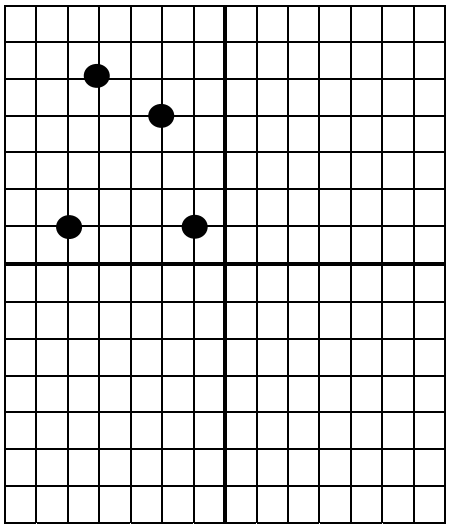
Practice: List the points plotted for each graph.

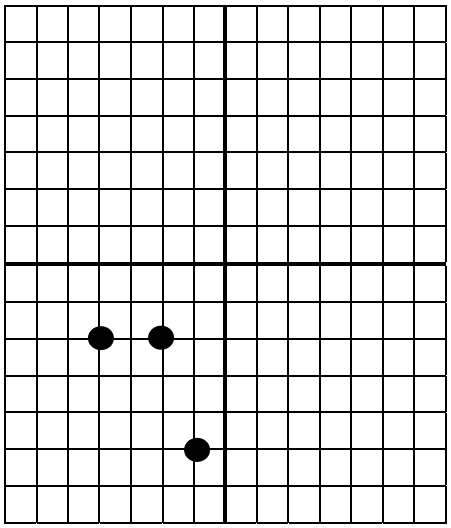
a)



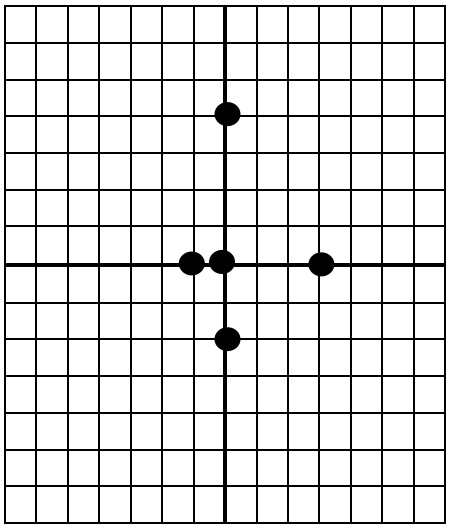


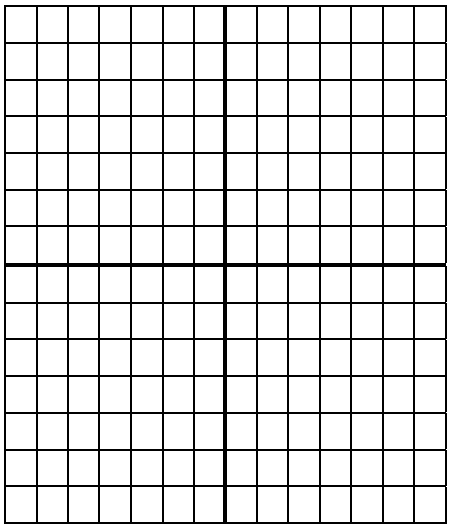
b)





c)

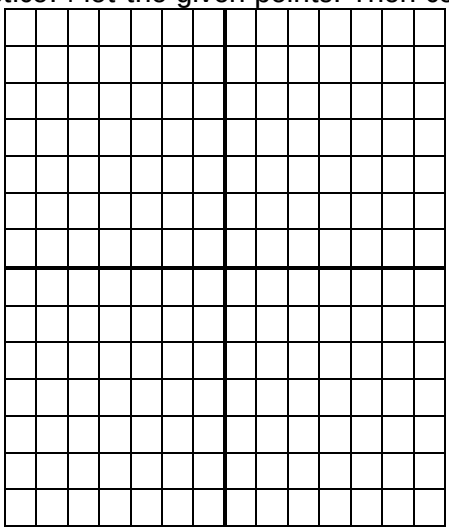




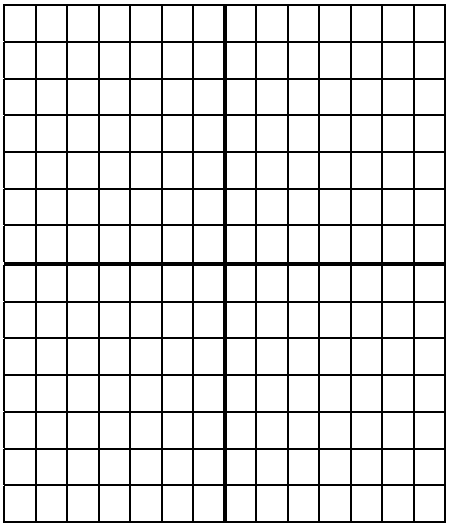
Plot your own design. List the points required for someone else to plot the same design.

Practice: Plot the given points. Then connect the dots.

d)

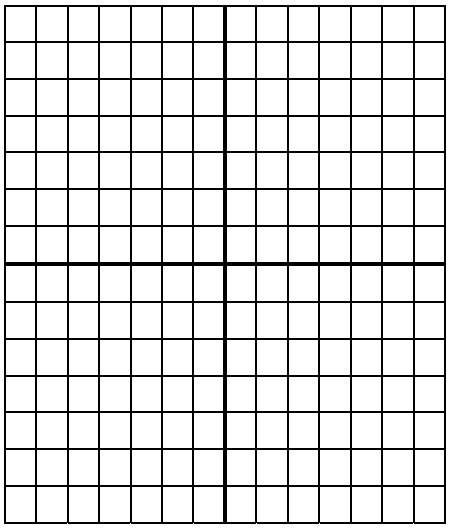


(3,4),
(1,2),
(-1,0),
(-3,-2),
(-5,-4)

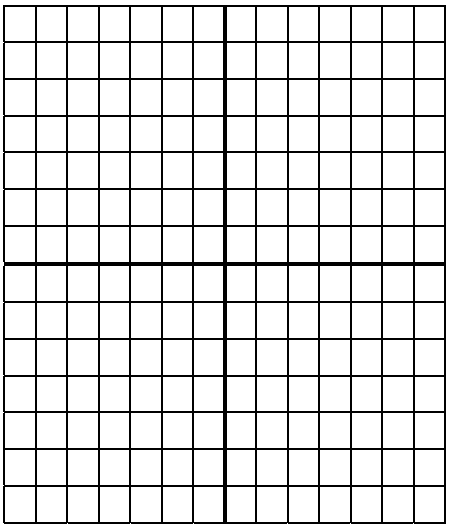


(7,7),
(6,4),
(5,1),
(4,-2),
(3,-5)

e)



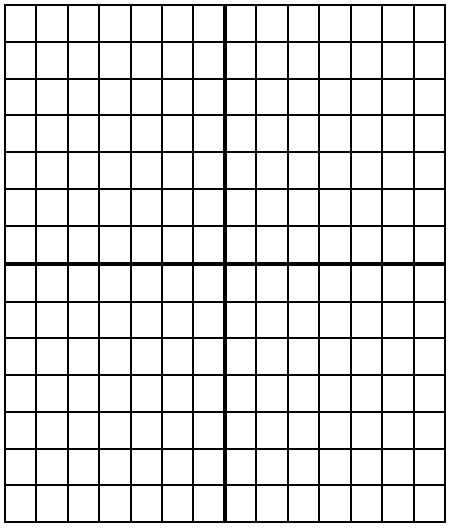
(1,4),
(2,3),
(2,1),
(1,0),
(-1,0),
(-2,1),
(-2,3),
(-1,4)



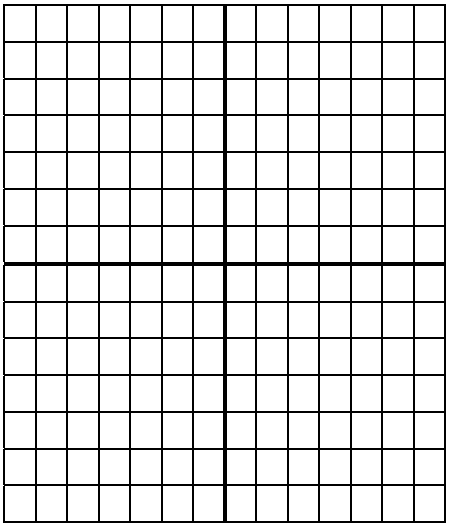
(-4,3),
(3,-3),
(0, 6),
(-3,-3),
(4,3),
(-4,3)

Connect these in the order plotted.

f)



(-4,0),
(-3,-1),
(-2,-2),
(-1,-2),
(0,-1),
(1,0)
Don't connect the last two.



(0,1),
(1,2),
(2,2),
(3,1),
(3,0),
(2,-1),
(1,-2),
(0,-3),
(-1,-2),
(-2,-1),
(-3,0),
(-3,1),
(-2,2),
(-1,2)

(-3,3)(0,3)