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Patterns on the Coordinate Plane Guided Notes

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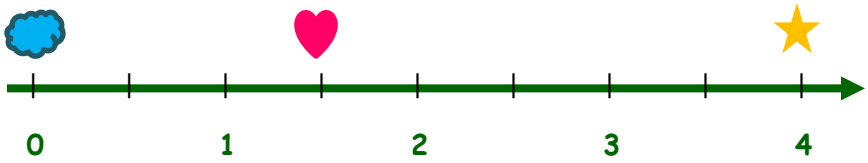
Coordinate System on a Line

Coordinate systems help us location the position of a point on a given number of dimensions. One of the most common system that we use is the **number line**.

Example:



The one above is an example of what a number line would look like. This helps know that ♡ has a value or coordinate of **1.5** and ★ has a value or coordinate of **4**.

● has a value of **0** and any point located at 0 is called the origin.

Sample Problem 1:

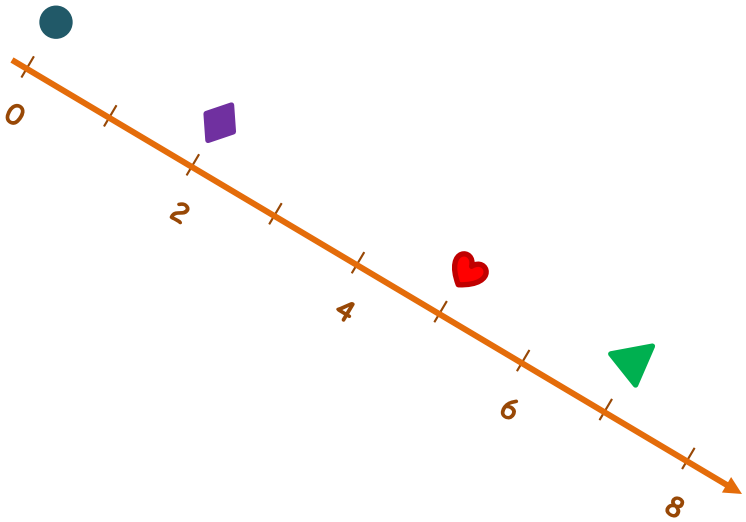
1. Each of the shapes is placed on the number line as shown below. Find the coordinate of these points.

a. ♥

b. ●

c. ◆

d. ▲



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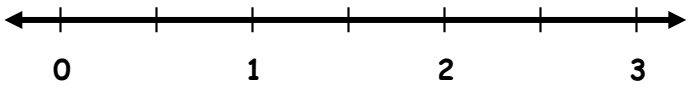
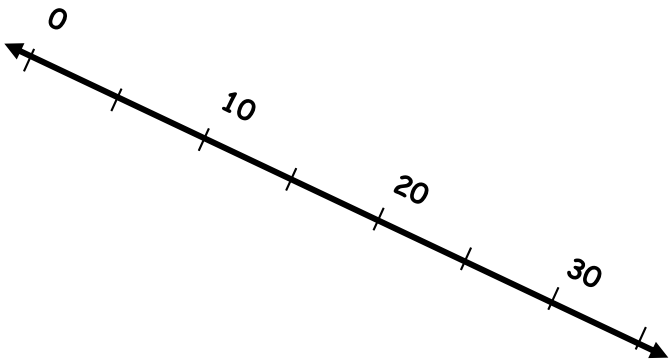
2. Plot the following points on the number lines.

a.
Plot *B* so that it has a coordinate of 1.5.

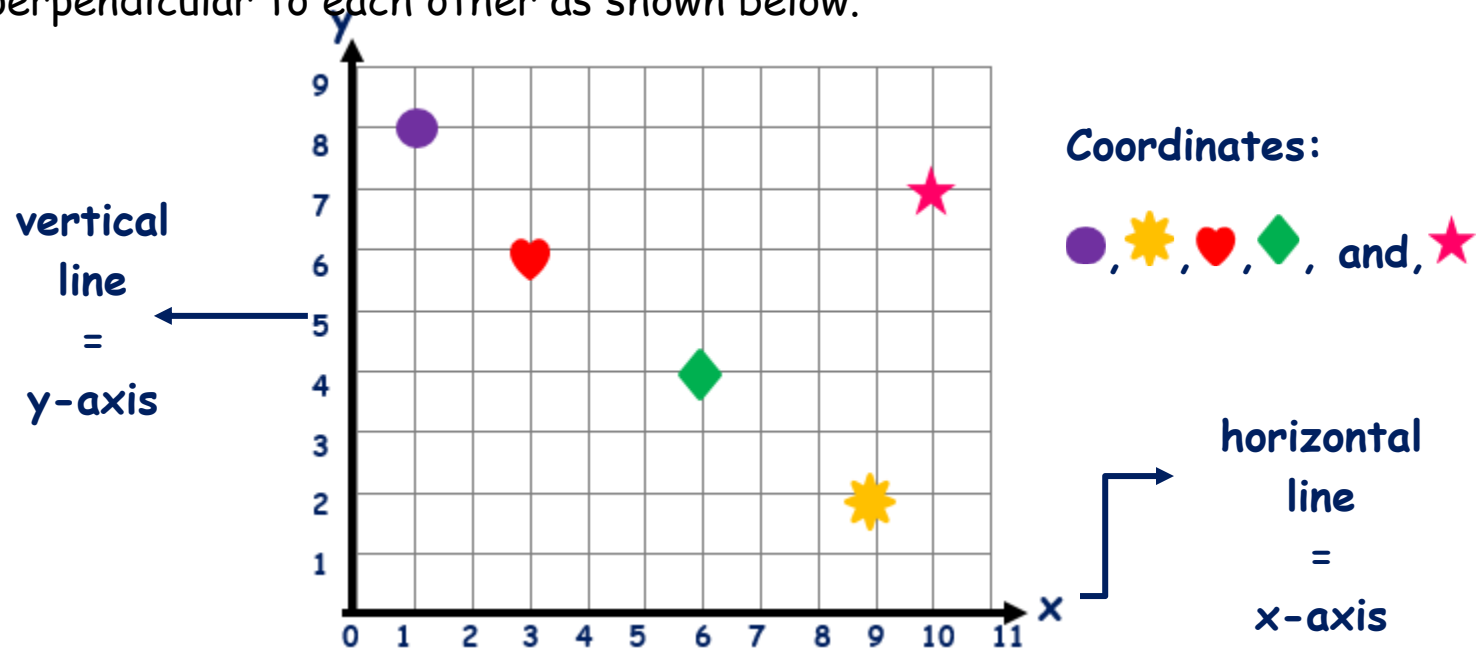


b.
Plot *M* so that it has a distance of 25 from the origin.



Coordinate System on a Plane

The coordinate system that we'll be focusing on is actually the **coordinate planes**. The coordinate plane is made up of two number lines perpendicular to each other as shown below.



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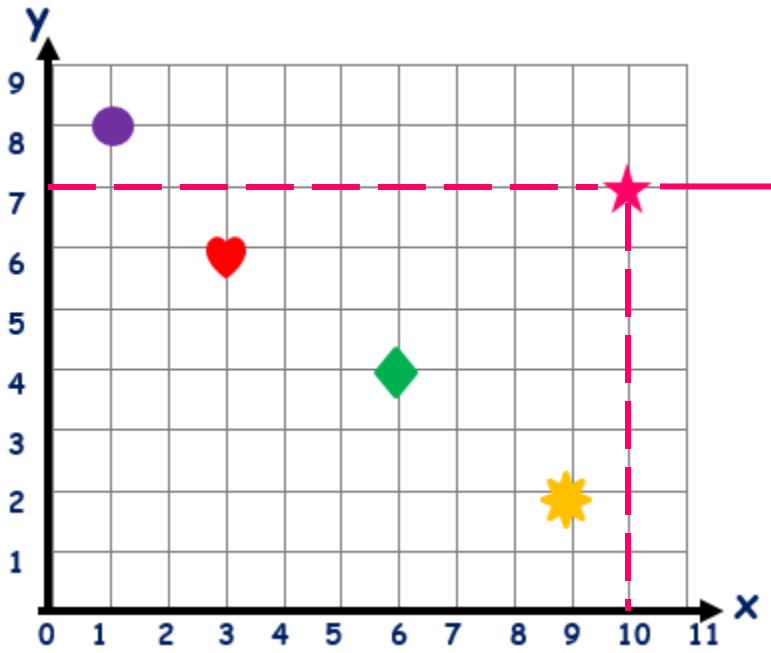
Since there are two lines or axes now, we also use two values for the coordinates: **(x, y)**.

So when writing or locating the coordinate, we first use the value of the x or the point parallel to x-axis followed by the y value or the point parallel to the y-axis.

Example:



Value of x = 10

Value of y = 7

So, value of the coordinate:

(10, 7)

Using the same process, we have these values for the remaining four coordinates:

Coordinates:

● = (1, 8)

♥ = (3, 6)

✸ = (9, 2)

◆ = (6, 4)

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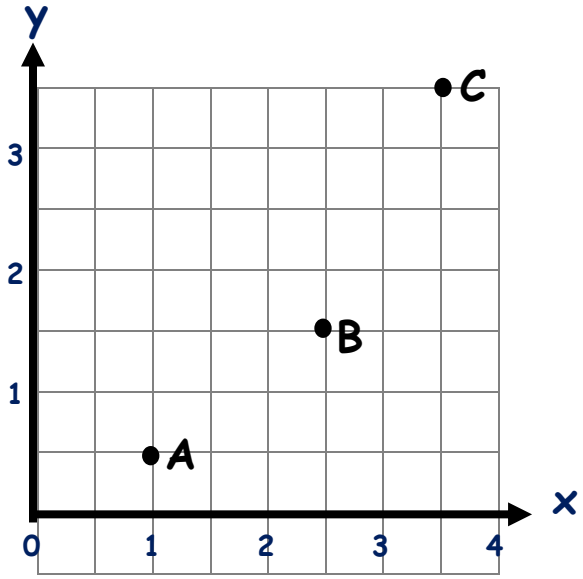
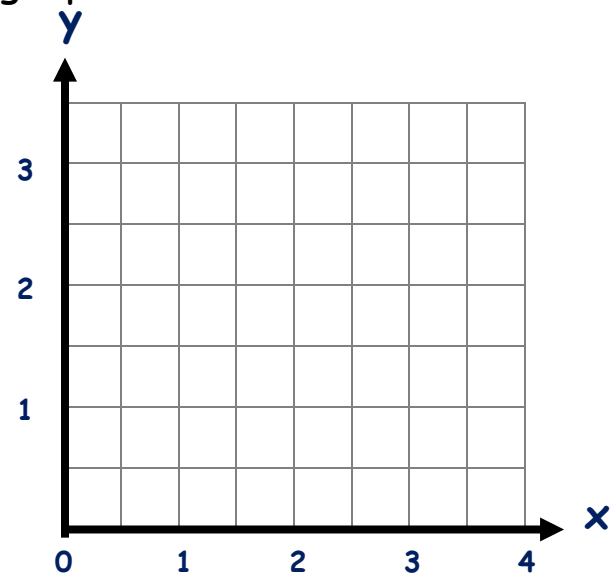
Sample Problem 2:

1. Find the coordinates of A, B, and C using the graph shown below.



2. Given that **L = (3, 1.5), M = (0, 2)**, and **N = (2.5, 3)**, plot L, M, and N on the graph below.



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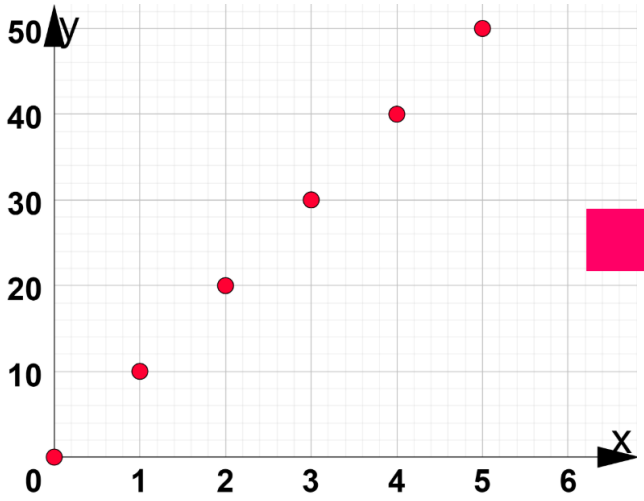
Number Patterns on Coordinate Planes

We can also observe number patterns for a given set of points on the coordinate plane. What we can do is construct a table showing the values of x and y values.

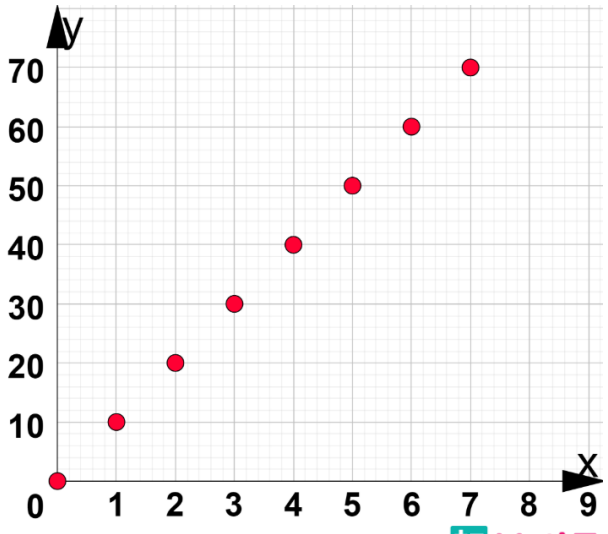
Example:



x	y	
0	0	0 = 10(0)
1	10	10 = 10(1)
2	20	20 = 10(2)
3	30	30 = 10(3)
4	40	40 = 10(4)
5	50	50 = 10(5)

This means that for every x, y is ten times bigger or **y = 10(x).**

This also means that (6, 6(10)) = **(6, 60)** and (7, 7(10)) = **(7, 70)** follow the same pattern.



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Sample Problem 3:

Construct tables representing the sets of coordinates represented by ◆ and ● as shown in the graph below. Then find the rule for each set of coordinates and determine the respective values at **x = 10**.