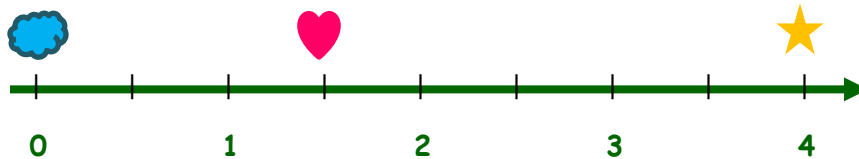


Patterns on the Coordinate Plane Guided Notes

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:



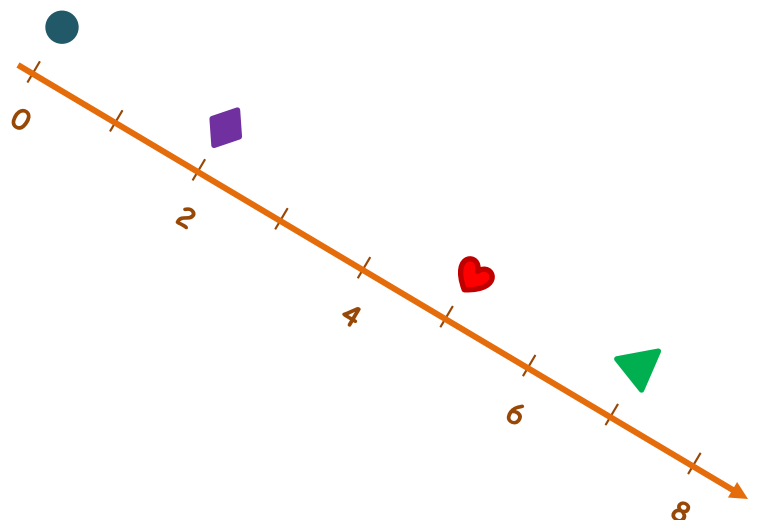
The one above is an example of what a number line would look like. This helps know that **♥** has a value or coordinate of **1.5** and **★** has a value or coordinate of **4**.

☁ 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. **▲**

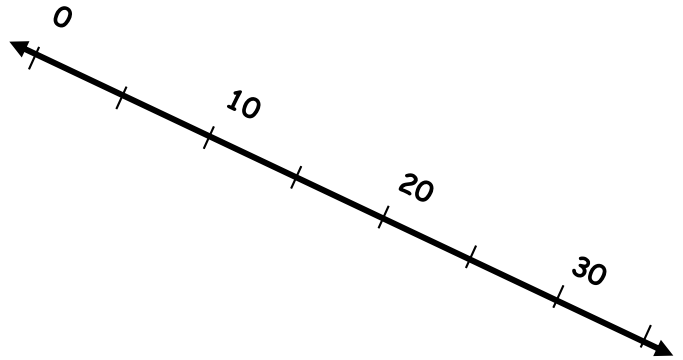
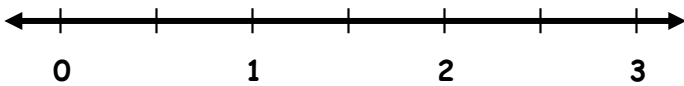


Patterns on the Coordinate Plane Guided Notes

2. Plot the following points on the number lines.





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

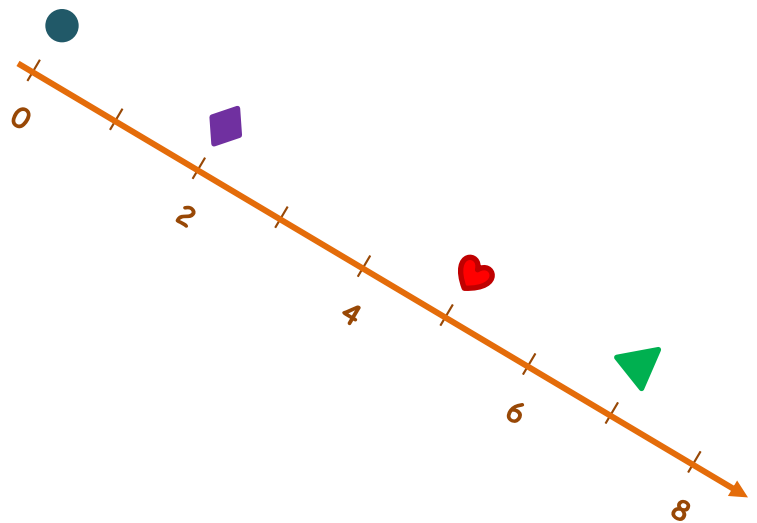
b.
Plot *M* so that it has a distance of 25 from the origin.



Solution:

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

- a.  = 5
- b.  = 0
- c.  = 2
- d.  = 7

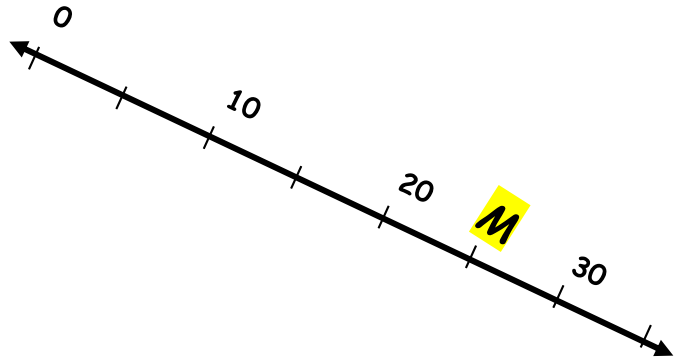
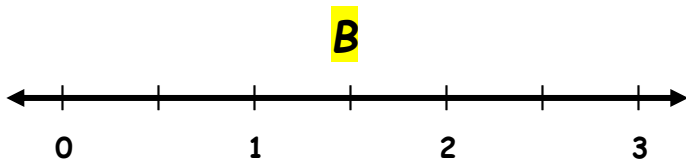


Patterns on the Coordinate Plane Guided Notes

2. Plot the following points on the number lines.

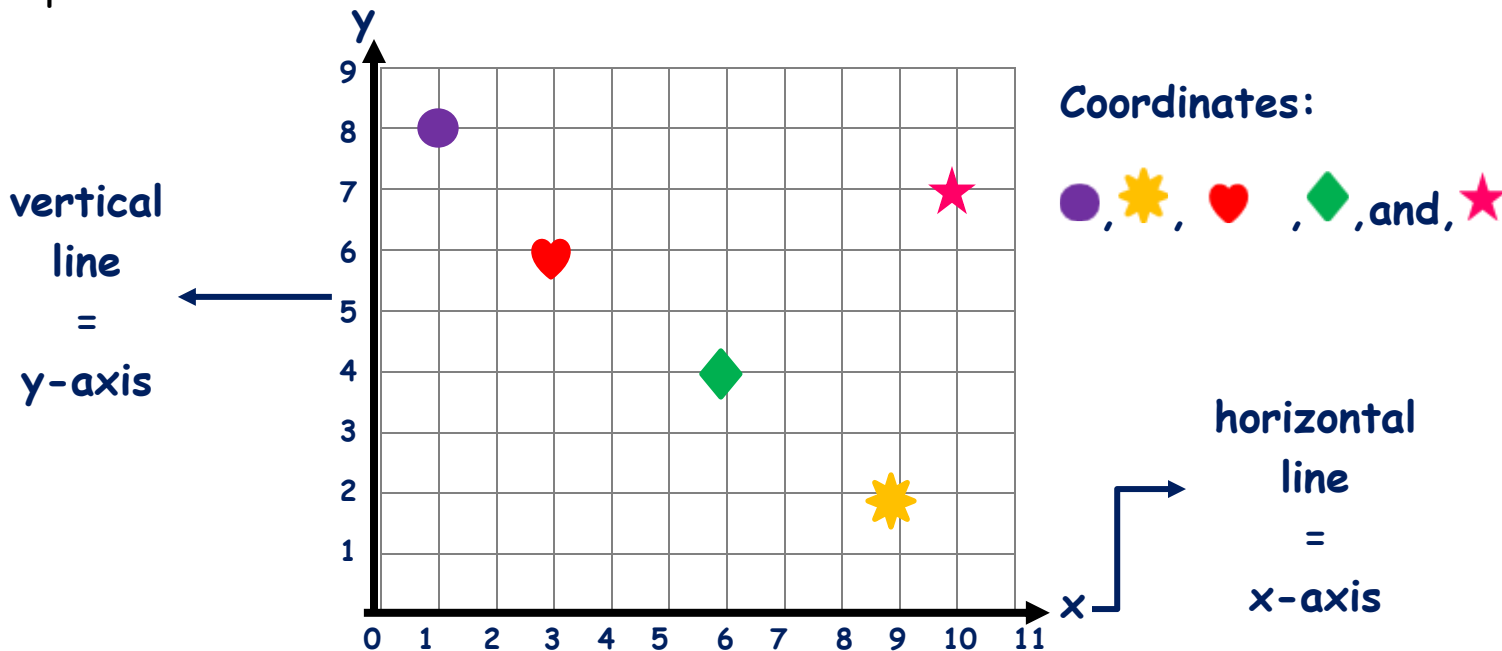
a.
Plot *B* so that it has a coordinate of 1.5.

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.



Patterns on the Coordinate Plane

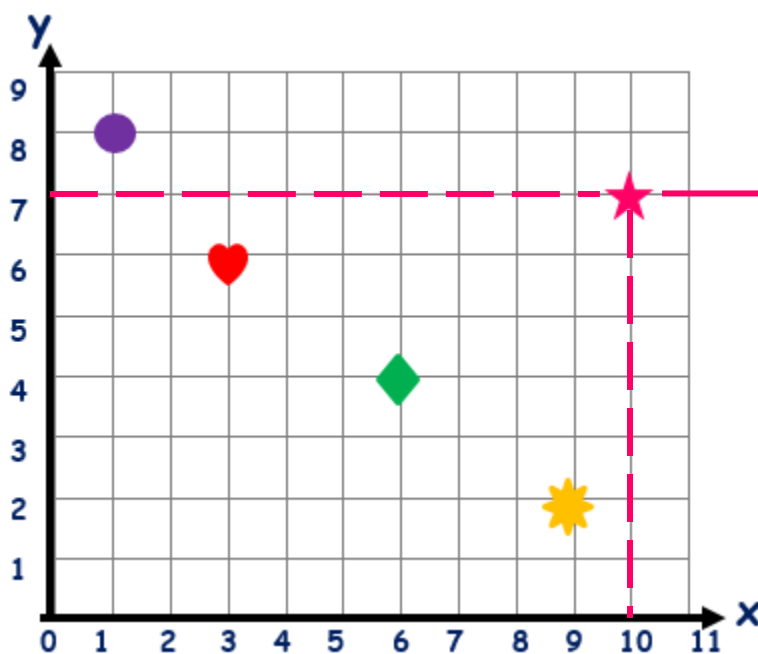
Guided Notes

Math 5

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:

● = $(1, 8)$

♥ = $(3, 6)$

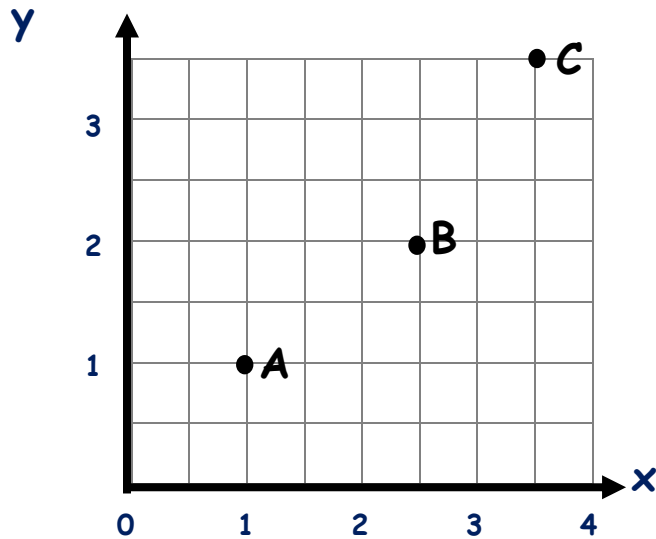
★ = $(9, 2)$

◆ = $(6, 4)$

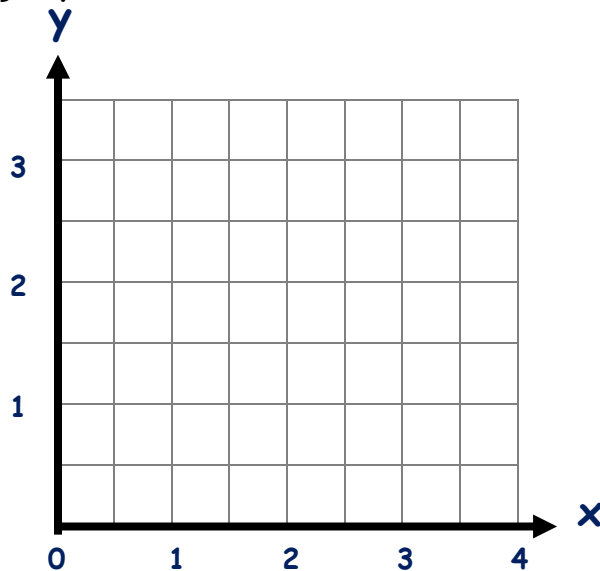
Patterns on the Coordinate Plane Guided Notes

Sample Problem 2:

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

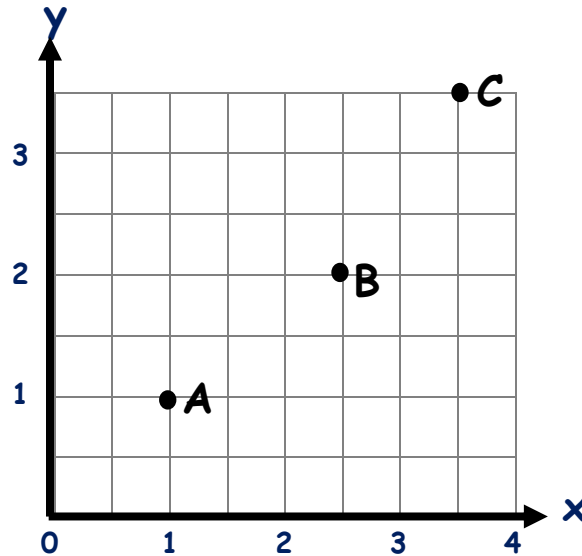


2. Given that $L = (3, 1.5)$, $M = (0, 2)$, and $N = (2.5, 3)$, plot L, M, and N on the graph below.



Patterns on the Coordinate Plane Guided Notes**Solution:**

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

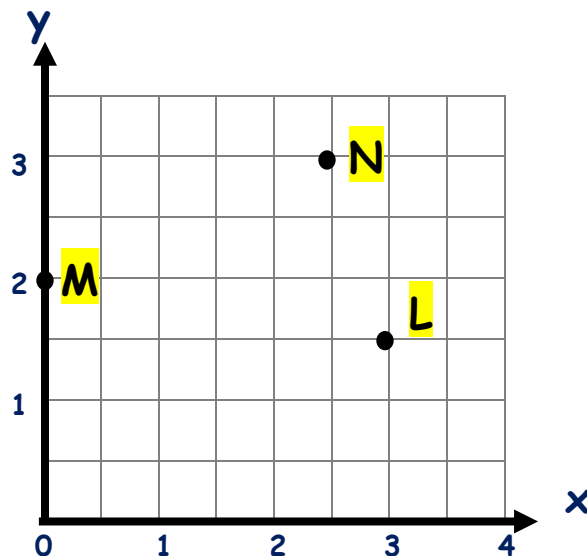


$$A = (1, 1)$$

$$B = (2.5, 2)$$

$$C = (3.5, 3.5)$$

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

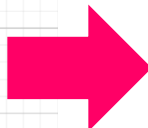
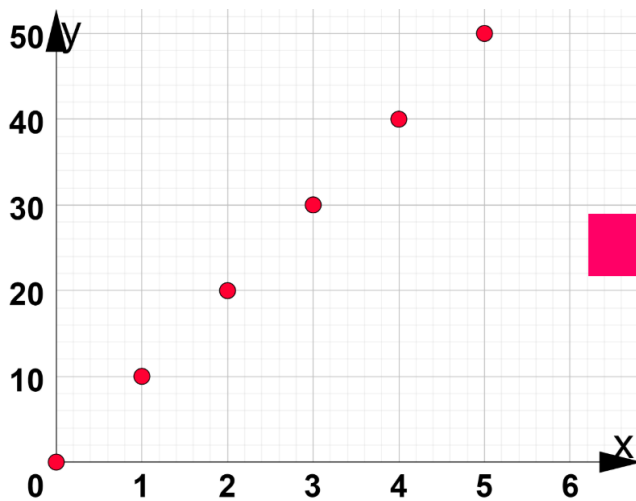


Patterns on the Coordinate Plane Guided Notes

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.

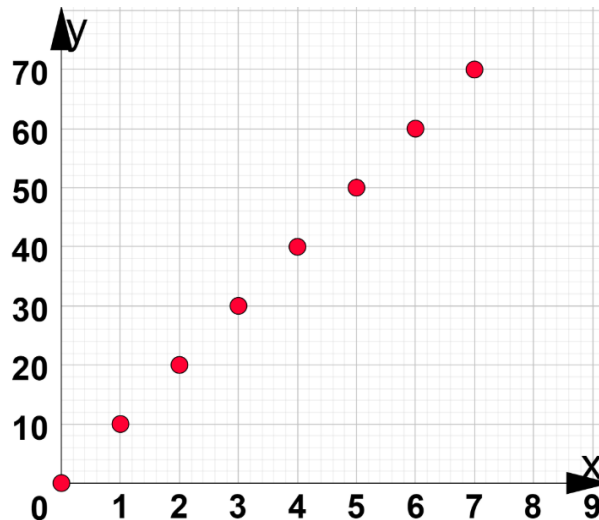
Example:



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.

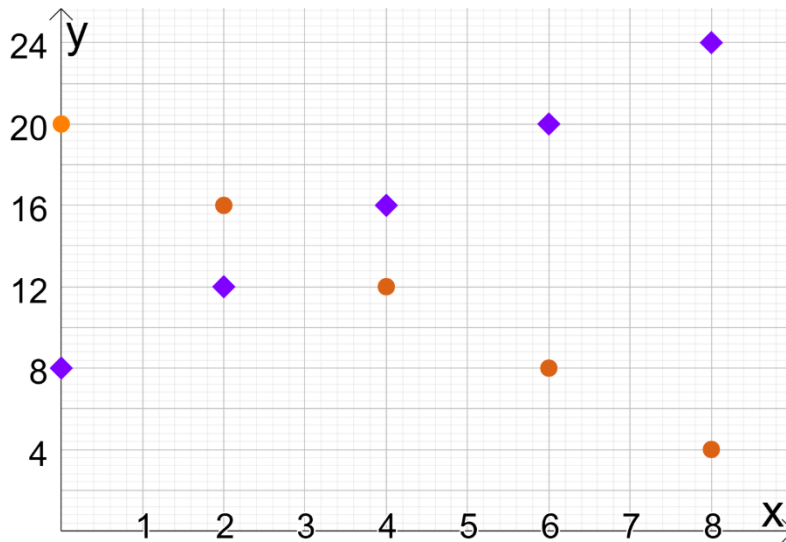


Patterns on the Coordinate Plane Guided Notes

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 $x = 10$.



x	y
0	8
2	12
4	16
6	20
8	24

$$8 = 0(2) + 8$$

$$12 = 2(2) + 8$$

$$16 = 4(2) + 8$$

$$20 = 6(2) + 8$$

$$24 = 8(2) + 8$$



$$y = 2x + 8$$

At $x = 10$, $y = 2(10) + 8 = 28$

x	y
0	20
2	16
4	12
6	8
8	4

$$20 = 20 - 0(2)$$

$$16 = 20 - 2(2)$$

$$12 = 20 - 2(4)$$

$$8 = 20 - 2(6)$$

$$4 = 20 - 2(8)$$



$$y = 20 - 2x$$

At $x = 10$, $y = 20 - 2(10) = 0$