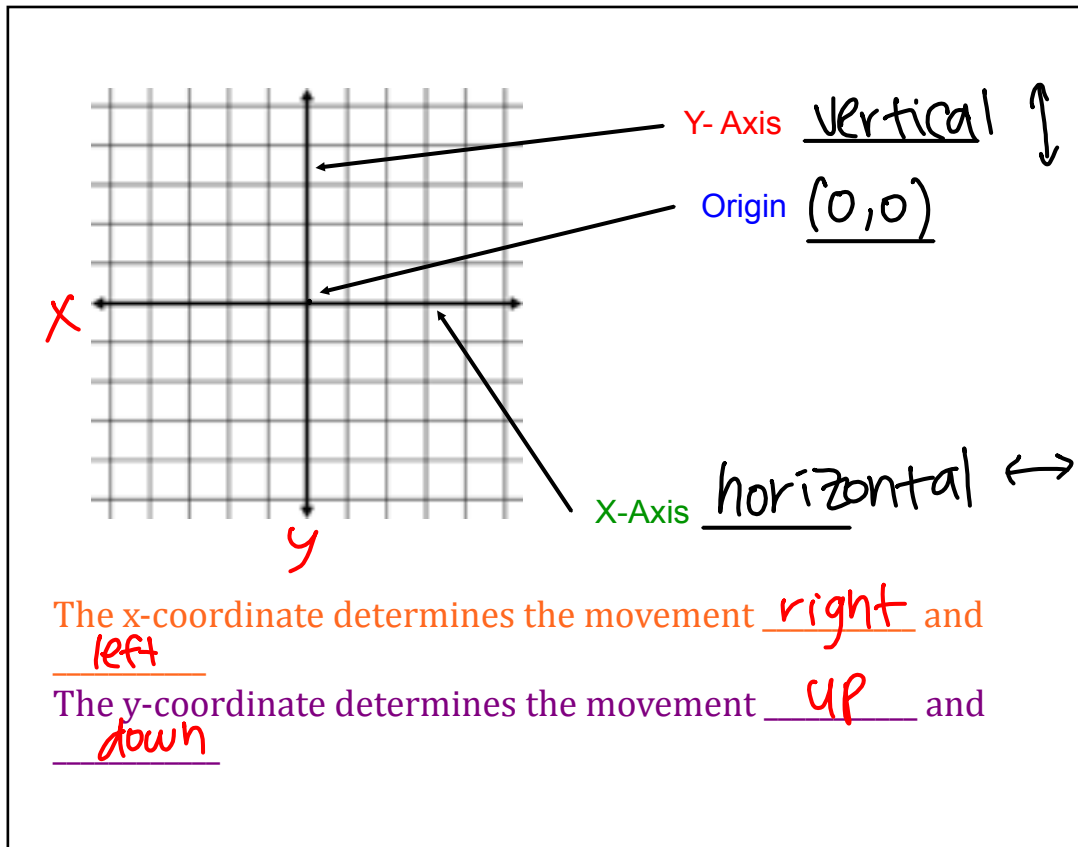## Variables

A _Variable_ is a _Symbol_ (often a letter) that represents a _numeric_ value.

$$5x$$
↑ variable

A coordinate plane is formed by two _axes_ that intersect at _point_, called the _Origin_.

(point)
Each _Value_ on the plane corresponds to an ordered pair of _coordinates_ (x, y)

The first number in an ordered pair is the _x-value_.
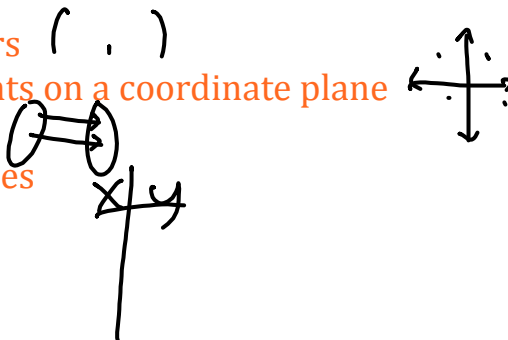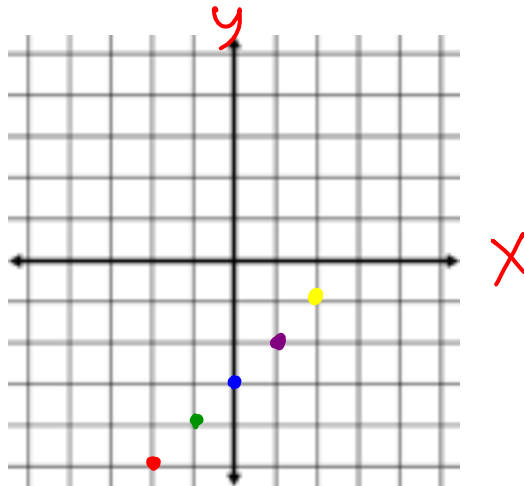The second number is the _y-value_.

Y- Axis _vertical_ ↕

Origin _(0,0)_

X

y

X-Axis _horizontal_ ↔

The x-coordinate determines the movement _right_ and _left_

The y-coordinate determines the movement _up_ and _down_

Each ordered pair shows a _relation_ between the _X_-value and _y_-value.

A _relation_ can be represented by:

> Ordered pairs (,)
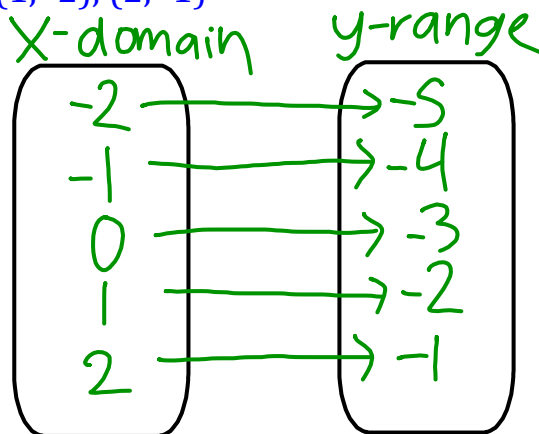> Plotting points on a coordinate plane
> Mapping
> Table of values
> Equation

$y = X + 1$

x | y

(x, y)

Plot the points (-2, -5), (-1, -4), (0, -3), (1, -2), (2, -1)

y

X

A __mapping__ illustrates how each _X_-value, or member of the domain, is paired with a _y_-value, or member of the range.

Draw a mapping for the above relation: (-2, -5), (-1, -4), (0, -3), (1, -2), (2, -1)

X-domain   y-range

-2 ———→ -5
-1 ———→ -4
 0 ———→ -3
 1 ———→ -2
 2 ———→ -1

D: -2, -1, 0, 1, 2

R: -5, -4, -3, -2, -1

A _table_ of _values_ also shows the relationship between _X_-values and _y_-values.

(x, y)

Create a table of values for the same relation: (-2, -5), (-1, -4), (0, -3), (1, -2), (2, -1)

X	y
-2	-5
-1	-4
0	-3
1	-2
2	-1

Another way to represent a _relation_ is through an _equation_

(x, y)

The equation that represents the relation:
(-2, -5), (-1, -4), (0, -3), (1, -2), (2, -1) is y = x - 3.

Verify:

$y = x - 3$

$-5 = -2 - 3 \rightarrow -5 = -5$ ✓

$-4 = -1 - 3 \rightarrow -4 = -4$ ✓

$-3 = 0 - 3 \rightarrow -3 = -3$ ✓

$-2 = 1 - 3 \rightarrow -2 = -2$ ✓

$-1 = 2 - 3 \rightarrow -1 = -1$ ✓

-2 -1 0 1

Pg 43: 9-13 odd, 17-20,
21, 22, 24, 25, 27-31 odd