

Patterns and Relations Review

Table of Values

For each of the patterns you filled out a table of values to describe the relationship from the pattern. We can refer to the white circles as input variables and the grey circles as output variables.

White Circles (input)	1	2	3	4
Grey Circles (output)	4	6	8	10

How much does each input value change by?

How much does each output value change by?

Table of Values

When the change in the input values is constant and the change in the output values is constant we call the relationship between the variables a **linear relation**.

White Circles (input)	1	2	3	4
Grey Circles (output)	4	6	8	10

Often times, our variables will just be two letters, such as x and y

Example: linear relation between variables x and y

x (input)	1	2	3	4	5
y (output)	4	7	10	13	16

change in x is constant: goes up by 1 each time

change in y is constant: goes up by 3 each time

Is the relationship between x and y linear?

x (input)	2	4	6	8	10
y (output)	8	16	24	32	40

Is the relationship between x and y linear?

x (input)	5	10	15	20	25
y (output)	6	16	23	37	46

Table of Values

<i>x (input)</i>	1	2	3	4	5
<i>y (output)</i>	3	5	7	9	10

We call each pair (x,y) an ordered pair

We use a table of values when we graph a relation.

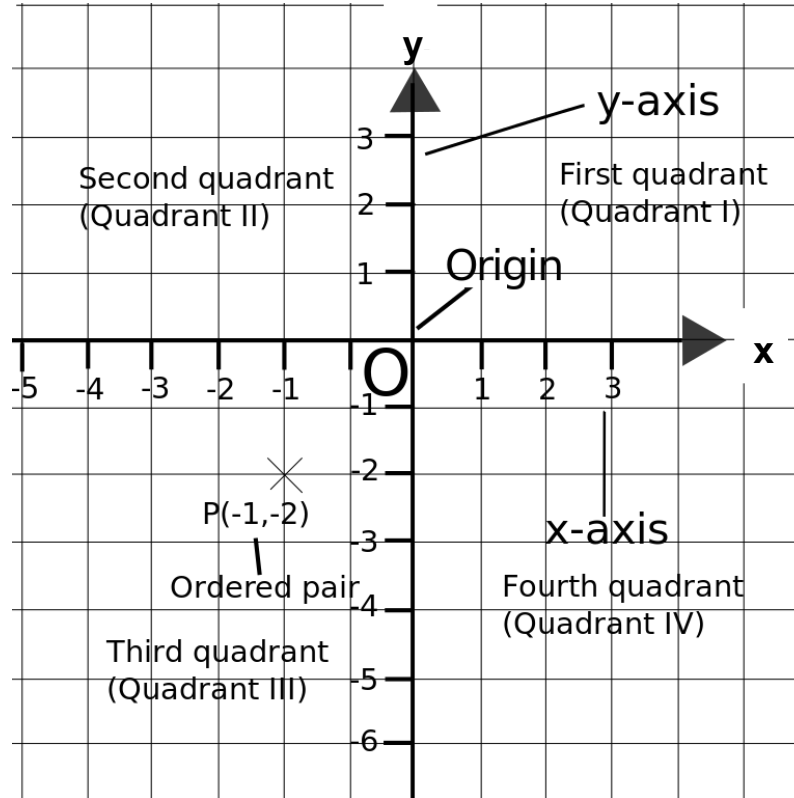
Ordered pairs (x,y) tell us the location of a point on a graph.

The Cartesian Plane

- *coordinate system*

Coordinates: a group of numbers that give the location of a point on a graph.

Each ordered pair is a point, (x,y) .



The **origin** is where we start from $(0,0)$.

x, horizontal direction
y, vertical direction

Quadrant 2

$(-, -)$

Quadrant 3

$(-, +)$

Quadrant 1

$(+, +)$

Quadrant 4

$(+, -)$

side
at
1
2
3
4
5
0
-1
-2
-3
-4
-5
ordinates
distance
since s
ed pairs
ion of

$(-4, 1)$

1st: move ← 4

2nd: move ↑ 1

$(-, +)$

$(-5, -3)$

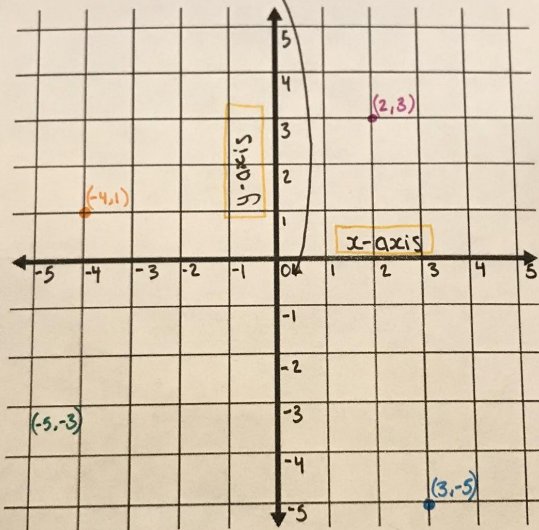
1st: move ← 5

2nd: move ↓ 3

$(-, -)$

The Cartesian Plane

Origin: where x and y -axis intersect
at $(0, 0)$
* always start here



When writing coordinates:

- horizontal distance first (x) ← +
- vertical distance second (y) ↑ ↓

We call these ordered pairs (x, y) and they give a location of a point.

$(2, 3)$

1st: move → 2

2nd: move ↑ 3

$(+, +)$

$(3, -5)$

1st: move → 3

2nd: move ↓ 5

$(+, -)$