

Section 3.1 The Cartesian Plane

1) The Cartesian plane is also known as a graph.

This coordinate system has a horizontal x-axis and a vertical y-axis.

The point where these two axes intersect (join) is called the **origin**.

The Cartesian plane (graph) is divided into four quadrants; 1, 2, 3, 4.

The axes themselves do not belong to a quadrant.

Quad 1 (I) (+, +)
Quad 2 (II) (-, +)
Quad 3 (III) (-, -)
Quad 4 (IV) (+, -)

Draw a graph
Label the quadrants
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2) The coordinates of a point (4,2) make an **ordered pair** (x,y).

Plot the following ordered pairs (points) on a Cartesian plane.

A(4,1) B(-2,3) C(-4,-2) D(3,-3) E(2,0) F(0,3)

G(0,-1) H(-2,0)

Notice that E, F, G and H are on the axis because one of the coordinates is 0.

3) If the values of x increase at regular increments and the corresponding y's also change in regular increments, then you have a **RELATION** (pattern) known as a **LINEAR RELATION**.

All linear relations are straight lines.

4) Find the patterns and predict the next x and y values.

x	y
1	4
3	3
5	2

5) A **linear function** is when each x-value only has one corresponding y-value.

Which sets are linear functions?

a) $\{(-3,2) (-1,1) (1,0) (3, -1)\}$

b) $\{(2,5) (2,3) (2,1) (2,-1)\}$

c) $\{(-5,4) (-2,-4) (1,-4) (4,-4)\}$

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