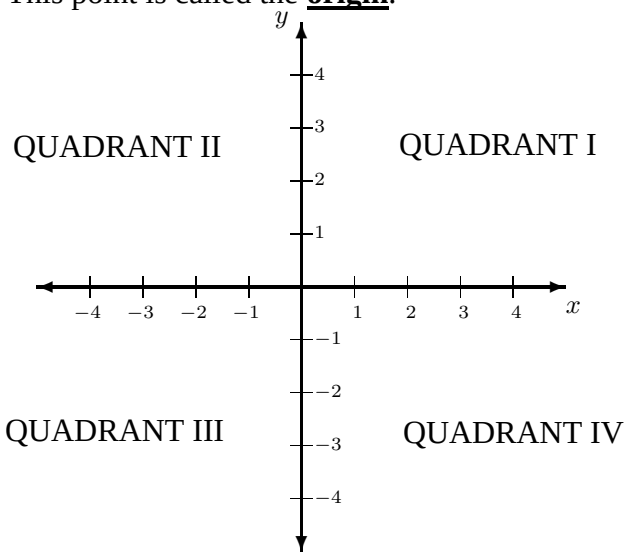
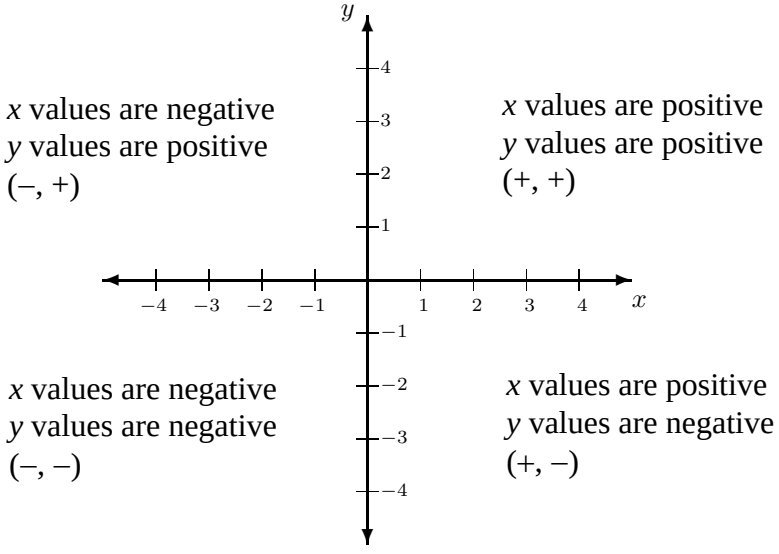
The Rectangular Coordinate System

The rectangular coordinate system is formed by two number lines. These number lines are usually called the ***x*-axis** and the ***y*-axis**. The number lines are at right angles to each other and share one point where they cross. This point is called the **origin**.



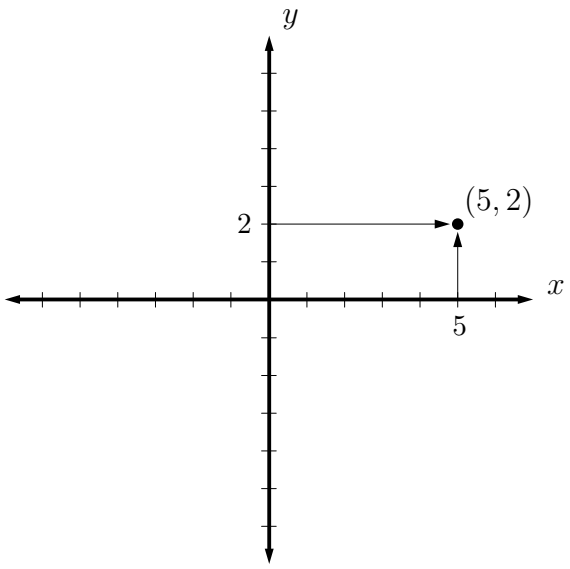
NOTE that the axes divide the plane into four sections called **QUADRANTS,** and that the *y* values are positive above the *x*-axis and negative below the *x*-axis. The *x* values are positive to the right of the *y*-axis and negative to the left of the *y*-axis.

Any point in the plane can be described by an ordered pair of numbers. The first number in the ordered pair is the *x* value and the second number is the *y* value. These values are called the *x* and *y* coordinates. The *x*-coordinate is also called the **ABSCISSA,** and the *y*-coordinate is also the **ORDINATE**.



The graph of an ordered pair is a point in the plane. The location of that point is given by its position relative to the *y*-axis (*x* value) and its position relative to the *x*-axis (*y* value).

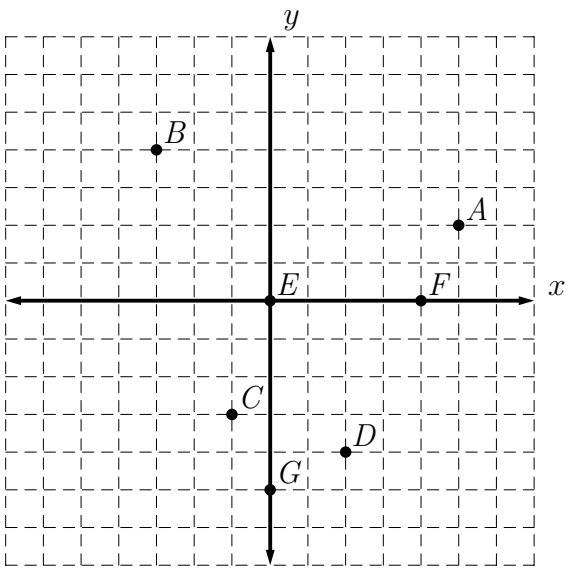
To plot (5, 2) draw a vertical line through 5 on the *x* axis. Draw a horizontal line through 2 on the *y* axis. The point is where the lines intersect.



NOTE that where *x* and *y* both equal zero, the point is the origin. Where the *x* value is zero, the point is on the *y*-axis and where the *y* value is zero, the point is on the *x*-axis. Each point can be plotted by drawing a vertical line from the *x* value on the *x* axis and a horizontal line from the *y* value on the *y* axis. The point with the coordinates corresponding to the points on the axes is at the intersection of the two lines.

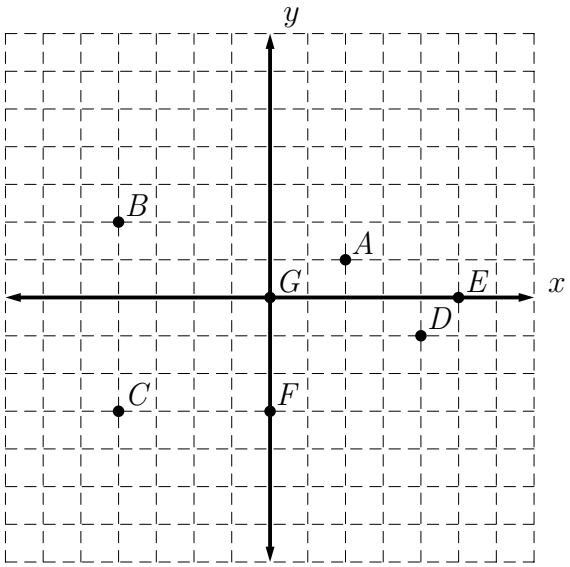
We will graph the following ordered pairs:

(*x*, *y*)	(*x*, *y*)
A (5, 2)	E (0, 0)
B (–3, 4)	F (4, 0)
C (–1, –3)	G (0, –5)
D (2, –4)	



To find the coordinates of a point we must draw a vertical line from the point to the *x*-axis and a horizontal line from the point to the *y*-axis. The *x* and *y* values where the lines cross the axes give the coordinates of the point.

We will give the coordinates of the following points:



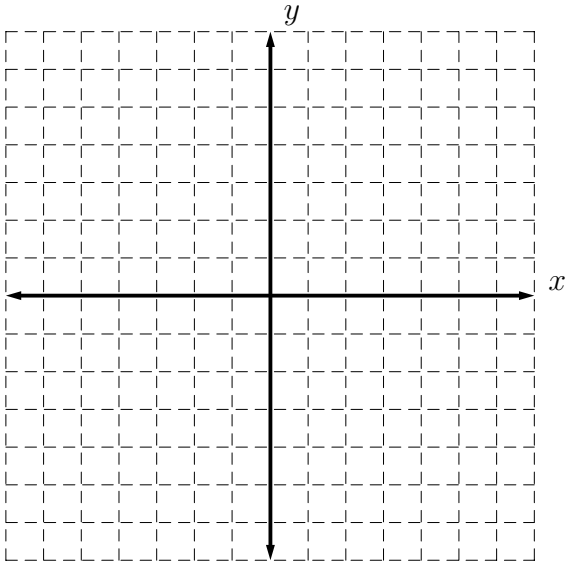
(*x*, *y*)	(*x*, *y*)
A (2, 1)	E (5, 0)
B (–4, 2)	F (0, –2)
C (–4, –3)	G (0, 0)
D (4, –1)	

NOTE that point E is on the *x*-axis and the *y*-coordinate is zero. The point F is on the *y*-axis and the *x*-coordinate is zero. Point G is at the origin and both the *x* and *y* coordinates are zero.

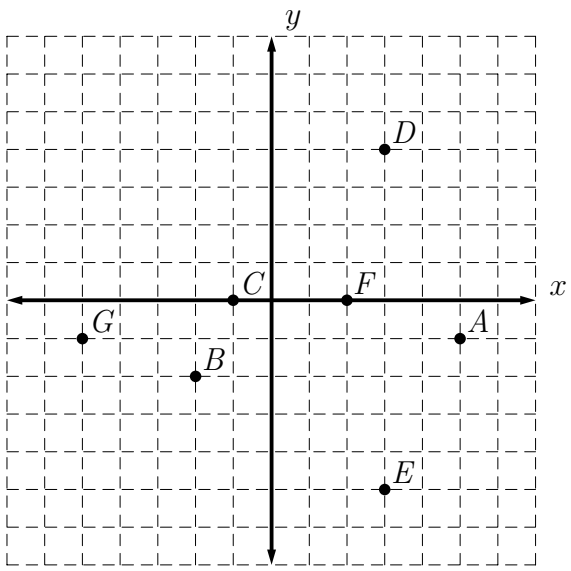
EXERCISES:

1. Graph the following ordered pairs.

A (3, 2)
B (–4, 1)
C (–5, –1)
D (2, –4)
E (0, –1)
F (3, 0)
G (0, 0)



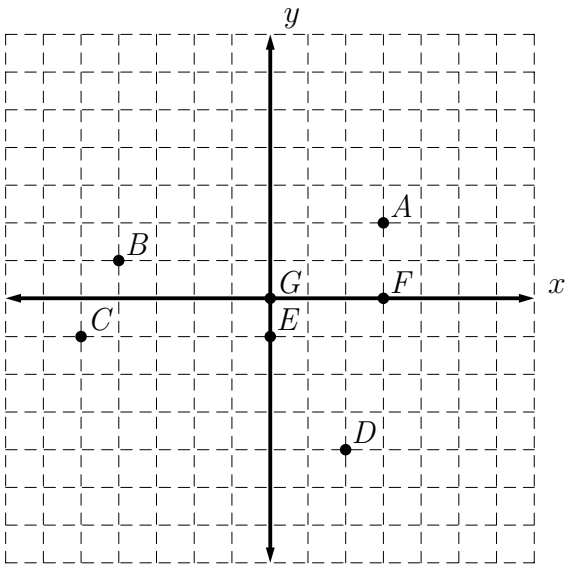
2. Give the coordinates of the following points:



A (,)
B (,)
C (,)
D (,)
E (,)
F (,)
G (,)

KEY:

1.



2. A (5, –1)
B (–2, –2)
C (0, –1)
D (3, 4)
E (3, –5)
F (2, 0)
G (–5, –1)