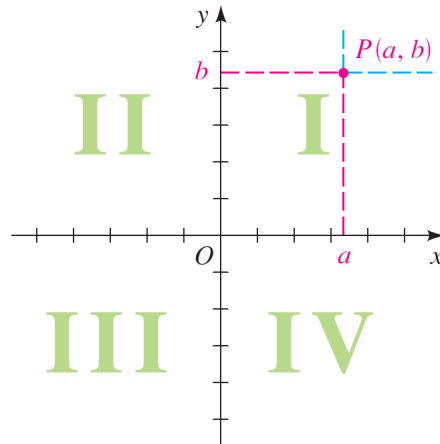


# The Coordinate Plane

Just as points on a line can be identified with real numbers to form the coordinate line, points in a plane can be identified with ordered pairs of numbers to form the **coordinate plane** or **Cartesian plane**. To do this, we draw two perpendicular real lines that intersect at 0 on each line. Usually, one line is horizontal with positive direction to the right and is called the  **$x$ -axis**; the other line is vertical with positive direction upward and is called the  **$y$ -axis**. The point of intersection of the  $x$ -axis and the  $y$ -axis is the **origin  $O$** , and the two axes divide the plane into four **quadrants**, labeled I, II, III, and IV in the Figure below. (The points *on* the coordinate axes are not assigned to any quadrant.)



Any point  $P$  in the coordinate plane can be located by a unique **ordered pair** of numbers  $(a, b)$ , as shown in the Figure above. The first number  $a$  is called the  **$x$ -coordinate** of  $P$ ; the second number  $b$  is called the  **$y$ -coordinate** of  $P$ . We can think of the coordinates of  $P$  as its “address,” because they specify its location in the plane. Several points are labeled with their coordinates in the Figure below.

