雙語教學主題(國中七年級教材):介紹座標平面

Topic: introducing coordinate plane

下面是這個單元需要用到的單字

Here are some of the words we will use in the class

number line	horizontal line
vertical line	origin 原點
x axis	y axis
unit	quadrant 象限
plot	ordered pair 數對
perpendicular	intersect
coordinate plane 座標平面	x- coordinate
y- coordinate	dimension 維度
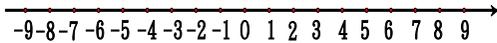
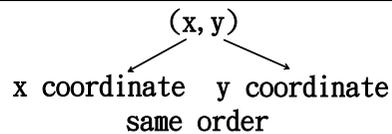|	
-9-8-7-6-5-4-3-2-1 0 1 2 3 4 5 6 7 8 9	Before we introduce the coordinate plane, let's review "number line" we learned A number line is a horizontal straight line with numbers placed at equal intervals or segments along its length. The numbers on the number line increase as one moves from left to right and decrease on moving from right to left. A unit is the distance between every 2 consecutive integers.
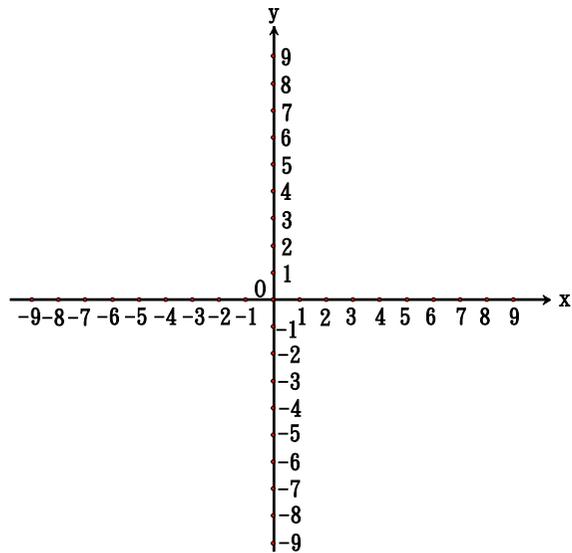
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y 9 8 7 6 5 4 3 2 1 0 −9−8−7−6−5−4−3−2−1 1 2 3 4 5 6 7 8 9 x −1 −2 −3 −4 −5 −6 −7 −8 −9	Now we place a number line vertically on the plane as it shows. These two number lines are perpendicular to each other, and intersect at their zeroes The horizontal line is called the x-axis, and the vertical line is called the y-axis We can see the positive numbers are above zero along the y-axis, and the negative numbers are below zero for the verticle axis. A number line is one dimensional, all the points we plot will stay on the line, but here we have a two dimensional plane, we now can show all the locations of the points on the coordinate plane using the corresponding x- and y- values
(x, y) x coordinate y coordinate same order	We use ordered pairs like (x,y) (we say parentheses x comma y), to represent where the points are along x or y- axis on the plane. Remember x- value comes first and y- value comes second, the order matters are always the same The first number x is called the x-coordinate and the second number y is the y-coordinate
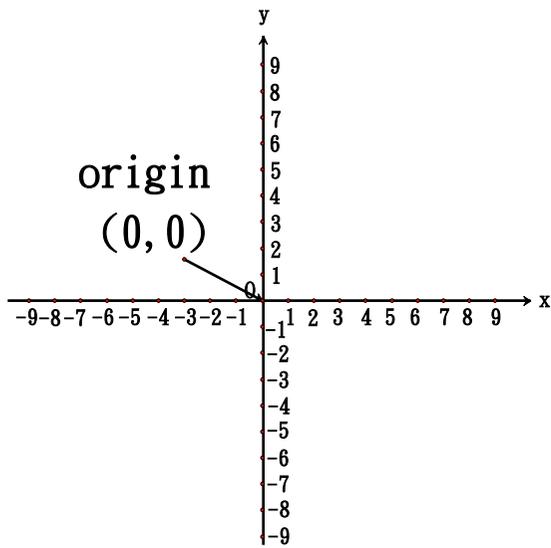
That's why it's called the coordinate plane.

For instance, the intersection of x- and y- axis is (0,0) which means the intersection point is located on x=0 and y=0

This point is called the origin.

(5, 2)

x=5 and y=2
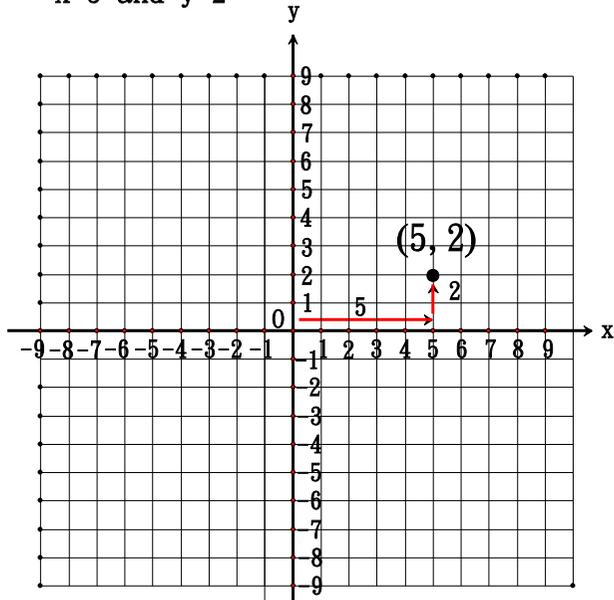
Another example: Find the location of the point (5,2) on the coordinate plane

The first number positive 5 represents the position on x axis, staring from the origin, we move 5 units in the positive   x direction and the second number positive 2 represents the position on y axis, starting from the origin, we move 2 units in the positive y direction
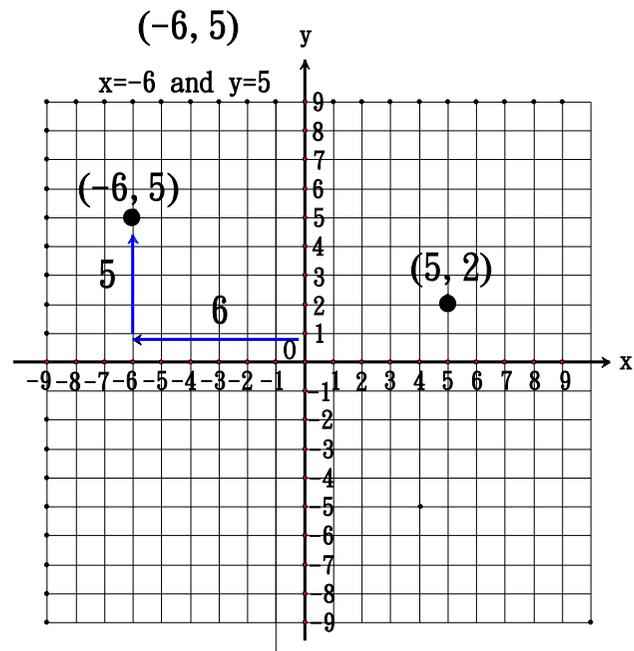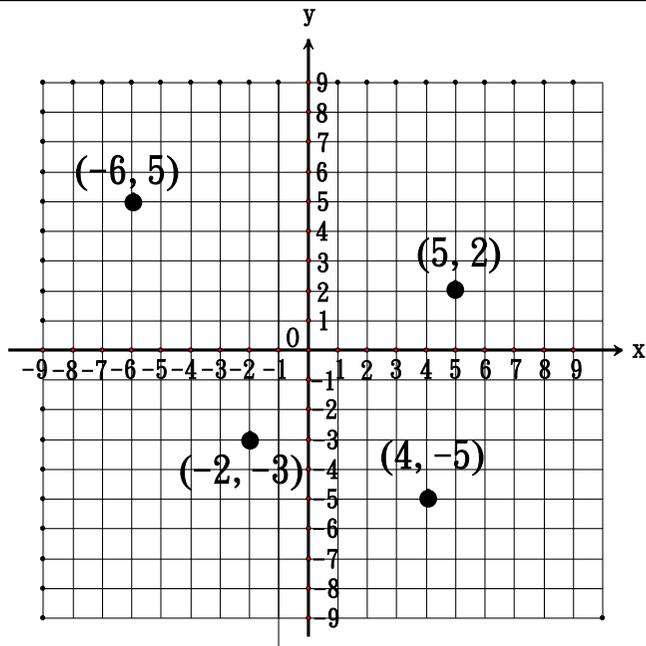
Let's see some more examples

Please plot the following points on the coordinate plane

(-6,5),(-2,-3),(4,-5)

For the point (-6,5), we know x=-6 and y=5

Since x is negative 6, we move 6 units in the negative x direction from the origin,   then move 5 units up in the positive y direction
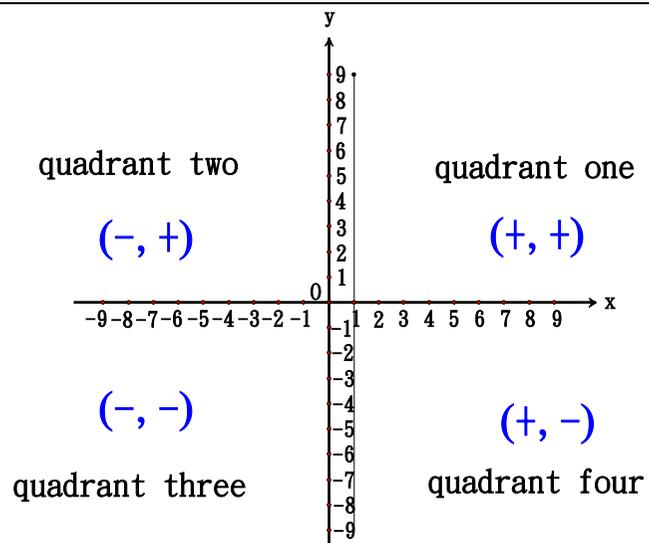
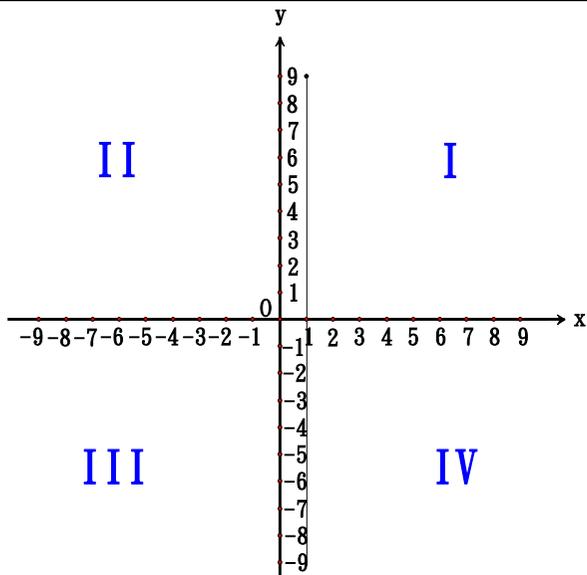|	
	When we finish plotting the points above, we get the location of these 4 points on the coordinate plane
	These points locate in different regions of the coordinate plane We name these regions quadrants The upper right region is quadrant one The value of x- and y- coordinates are both Positive The upper left region is quadrant two

y 9 8 7 6 5 4 3 2 1 quadrant two quadrant one (−, +) (+, +) 0 −9 −8 −7 −6 −5 −4 −3 −2 −1 1 2 3 4 5 6 7 8 9 x −1 −2 −3 −4 −5 −6 −7 −8 −9 (−, −) (+, −) quadrant three quadrant four	The value of x- coordinate is negative and y- coordinate is positive The lower left region is quadrant three The value of x and y- coordinates are both Negative and the lower right region is quadrant four The value of x- coordinate is positive and y- coordinate is negative In counterclockwise direction, we get four quadrants on the coordinate plane

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II $\quad$ I y-axis with values 9,8,7,6,5,4,3,2,1,0,−1,−2,−3,−4,−5,−6,−7,−8,−9 x-axis with values −9,−8,−7,−6,−5,−4,−3,−2,−1, 1, 2, 3, 4, 5, 6, 7, 8, 9 III $\quad$ IV	Normally Roman Numerals are used to label these quadrants Beware, x and y axes don't belong to any of the quadrants We say The coordinate plane consists of four quadrants and 2 axes
	Now let's do some practice here

This is a map of a community

1. Please find out all the x, y- coordinates for the location of the school, the baseketball court, the post office, the park, the library and the convenience store
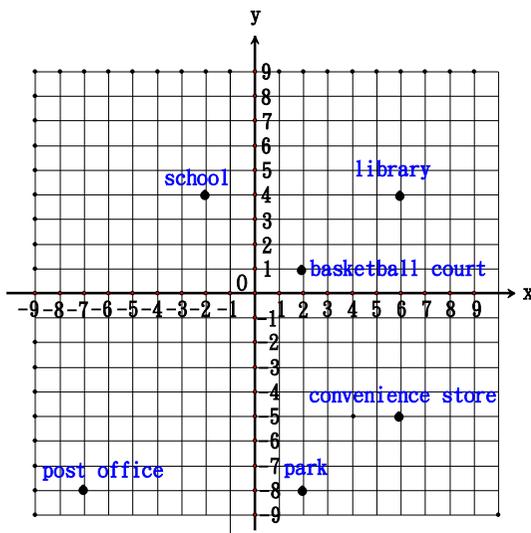
Ans:

School:_____ library:_____ park:_____

post office:_____ basketball court:_____

convenience store:_____

2. What quadrant is the school in?_____

3. Are the convenience store and the park in the

We take the location of the school as an example

Starting from the origin, we move 2 units left to negative 2 on the x axis, then move up 4 units to the school, so the x, y- coordinates of the school is (-2,4)

We say it's negative 2 comma 4

Ans:

School:__(-2,4)__ library:___(6,4)___ park:__(2,-8)___ post office:___(-7,-8)___

basketball court:___(2,1)___ convenience store:___(6,-5)___

2. What quadrant is the school in?___The schpp; is in the second quadrant___

3. Are the convenience store and the park in the second quadrant?_____
(yes or no? If no, please write down the correct answer)

No, they are in the fourth quadrant

second quadrant?_____ (yes or no? If no, please write down the correct answer)	

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