

# Using Code to Draw Triangles on the Cartesian Plane

Let's draw a triangle in Scratch by plotting and joining 3 points on a Cartesian plane.

Go to this application that has been premade in Scratch:

<https://scratch.mit.edu/projects/740509372/editor>

You will see the following code:

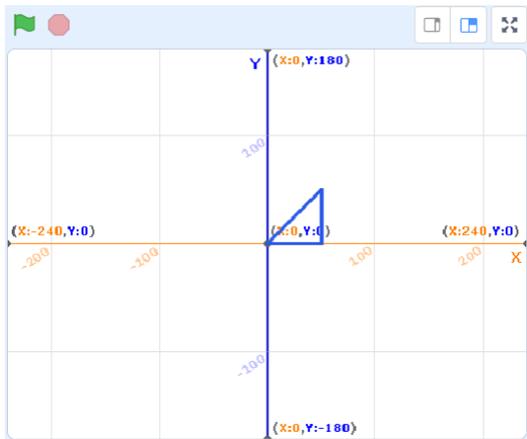
```

when clicked
  erase all
  set pen size to 3
  pen up
  set AXCoord to 0
  set AYCoord to 0
  set BXCoord to 50
  set BYCoord to 50
  set CXCoord to 50
  set CYCoord to 0
  set pen color to blue
  go to x: AXCoord y: AYCoord
  pen down
  glide .5 secs to x: BXCoord y: BYCoord
  glide .5 secs to x: CXCoord y: CYCoord
  glide .5 secs to x: AXCoord y: AYCoord
  
```

If you have a Scratch login, save the project in your Scratch account by selecting **Remix** at the top of the screen. A login is not required to work with the code, but you will not be able to save your changes without it.

## Using Code to Draw Triangles on the Cartesian Plane (cont'd)

- When you run the program by clicking on the **green flag** above the stage, you should see a triangle drawn on the stage:



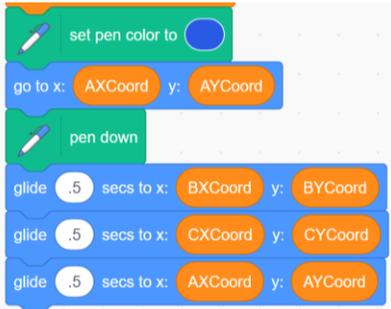
Here are the three points used to draw the triangle and where in the code you can see the instructions to plot them:

Point A (0,0)	Point B (50,50)	Point C (50,0)

Label the points on the image of the triangle above using A, B, and C.

## Using Code to Draw Triangles on the Cartesian Plane (cont'd)

Let's take a look at the code that draws the triangle.



- First, we set the pen colour to blue. We also set the **drawer** sprite to invisible, which is indicated below the stage.
- Then, we move the **drawer** sprite to the starting point, which is (**AXCoord**, **AYCoord**). We set these two variables to (0, 0) earlier in the code.
- Next, we put the pen down so that the sprite will leave a mark as it glides to each point.
- You can see that we glide the sprite to the B and C points and then back to the starting point, which is A.



## Using Code to Draw Triangles on the Cartesian Plane (cont'd)

2. Adjust the points as indicated below and execute the program to draw each triangle.  
Sketch each triangle on the image of the stage provided.

Points	Triangle
<p>a) <math>A(0, 0)</math> <math>B(50, 100)</math> <math>C(100, 0)</math></p>	
<p>b) <math>A(-100, 100)</math> <math>B(0, 0)</math> <math>C(-100, 0)</math></p>	
<p>c) <math>A(-100, -100)</math> <math>B(-50, -50)</math> <math>C(-100, 0)</math></p>	

## Using Code to Draw Triangles on the Cartesian Plane (cont'd)

3. Adjust the points two more times to make your own triangles. Indicate what points you used and sketch the triangles on the image of the stage.

Points	Triangle
a)	
b)	

## Using Code to Draw Triangles on the Cartesian Plane (cont'd)

4. Indicate the points that would be needed to make each of these triangles.  
You can check your answers by entering the points in the application.

Points	Triangle
a)	
b)	

In Master 5, you will adjust the application so that it contains subprograms.

### Additional Challenge

Alter the application to draw a rectangle with vertices  $A(0, 0)$ ,  $B(100, 0)$ ,  $C(100, 50)$ , and  $D(0, 50)$ .

Then change the coordinates in your application to draw 2 more different rectangles.