Worksheet

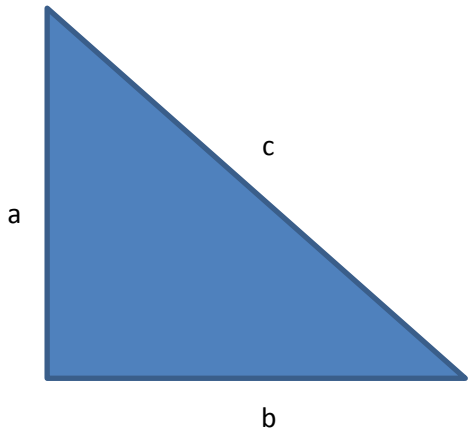
Date: 4/3/2019

"In the traces of Pythagoras" (a programming robots approach of Pythagoras theorem)

Petros Stavropoulos, CS Teacher

Activity 1

At the triangle below, measure both sides a and b and compute the length of the hypotenuse c. (You can use your computer's calculator for the calculations)



a=…….cm

b=…….cm

c=……..cm

$c = \sqrt{(a^2 + b^2)}$

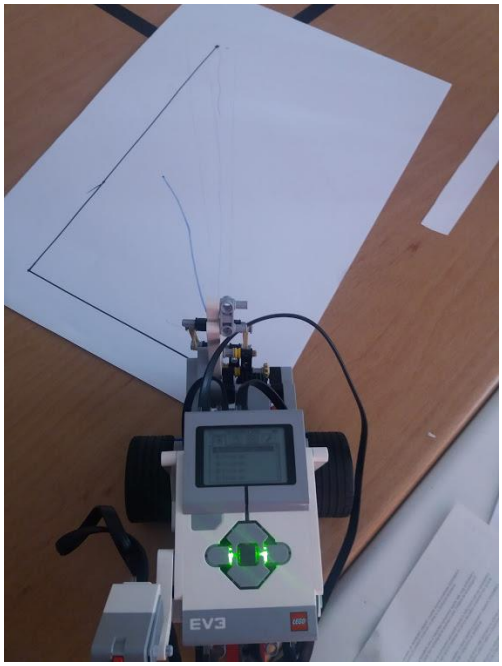
Activity 2

At this activity we must program our robot to calculate and draw the hypotenuse of the triangle that you have on your desk.

1. Open the LEGO MINDSTORMS EV3 Home Edition
2. Press file-> open project
3. Go to the desktop and choose the file Pythagoras.ev3
4. Click Open
5. Select the Pythagorian tab

In the program you have opened, you must insert the lengths of the right sides of the triangles. We have made two variables a and b to give them the values of the sides a and b respectively.

6. Measure both sides a and b of the triangle.
7. Insert the length of the side a in the variable 
8. Insert the length of the side b in the variable 
9. Connect the robot with your computer
10. Download the program to the robot using this button  in the right bottom corner of you screen
11. Find the name of your project on the screen of the robot.
12. Put the robot at the side's edge, looking at the other side's edge



13. Press the central button, when you' re ready.

Activity 3

At this activity we'll use our robot as a compasses, in order to draw the five circles of the Olympic Games Logo.

1. Search in Google for images with this logo and write the colors that each circle is. Can you write beside, the continent that represents? (You can Google it!)

- ……. ……..
- ……. ……..
- ……. ……..
- ……. ……..
- ……. ……..

2. Now you must make a little conversion at our robot, in order to move like a compasses. You have been given some Lego pieces.
3. Click on the Circle Tab
4. Now measure the radius of the circle that our robot will draw and insert it at the variable with the same name. Which distance are you going to measure? Why we must do it?
5. We must draw two concentric circles, whose radiuses will differ 0.5cm. How can we do it?
6. When we are ready we must put the stable point of our robot at the center of our cicle and then press the central button.

Activity 4

Now discuss with your team and choose a shape that you want your robot to draw (rectangle, square, trianlge etc)