BEA Math Camp Name:
6 July 2015

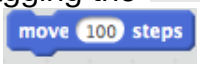
You will use **scratch** as a programming environment. Scratch is a visual programming environment in which you can create games, animations, interactive stories, music and many other things. We will use scratch at this camp, to solve problems. While you do not need to download and install scratch to use it, the program is free and available for download at: http://scratch.mit.edu/scratch2download/

Scratch projects are made up of objects called ***sprites*.** You can change how a sprite looks by giving it a different ***costume*.** You can make a sprite look like a person or a train or a butterfly or anything else. You can use any image as a **costume:** you can draw an image in the Paint Editor, import an image from your hard disk, or drag in an image from a website. You give instructions to a sprite, telling it to move or play music or react to other sprites. To tell a sprite what to do, snap together graphic blocks into stacks, called ***scripts*** *(*this is your program*)*. When you click on a script, **scratch** runs the blocks from the top of the script to the bottom.

The blocks are categorized by what the blocks can make the sprite do. The centre of the stage has coordinates:
x=0, y=0; and the corners at (240, 180); (240, -180); (-240, -180); (-240, 180)

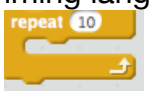
Project 1: Spiro graph

1. Every script can be started by dragging the 

block, found under the **Events** tab. Next, add a 

under it and click the green flag. . Since we want to make drawings,we need the 

. Add another move block under it and see the effect.

2. Draw a square of side 100. *Hint: Think about the angle the sprite needs to turn after moving 100 steps forward. How many times do you need to do that?* The useful thing about programming languages, is that they usually allow you to **control** repeated actions: 

3. Draw a triangle of side 100, using the repeat block. Once again, what is the angle the sprite needs to turn by after moving 100 steps? Is there a relationship between the number of sides of the figure and the angle?

4. Try and create a script that asks 

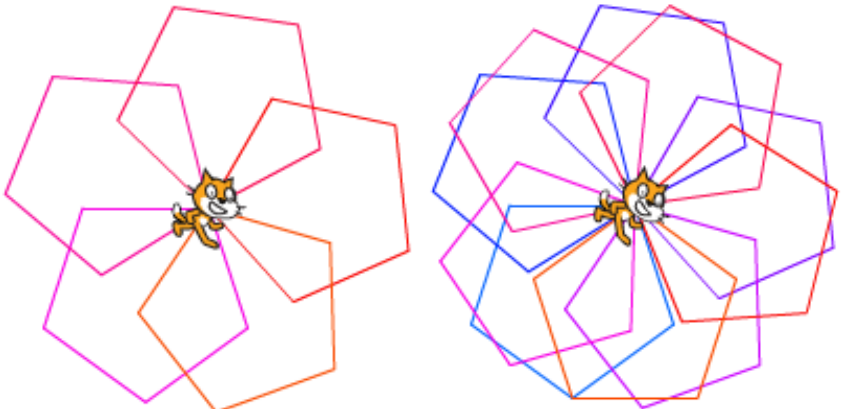
the user to enter the number of sides and then plots the figure. For this, you will need to create a **variable** (look under data), take the **answer** and st the variable to it. This allows you to use different number of sides for the figure.

5. What happens when the number of sides gets large?

6. Finally, modify the script to **repeat** the figure you have drawn a number of times. Make the number of repetitions of the figure dependent upon the number of sides for the figure.

7. Change the **pen colour** for each repetition of the figure.

Here is an example of a 5 sided figure (a pentagon) drawn 5 times and 10 times:



If you have time left over: Create a script, that when the green flag is clicked, it changes between two (or more) costumes repeatedly (forever). This is the basis for animation.