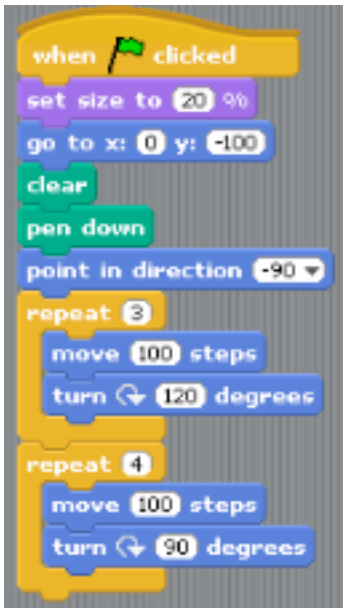
Scratch Geometry Explorations--2D shapes, lines and angles

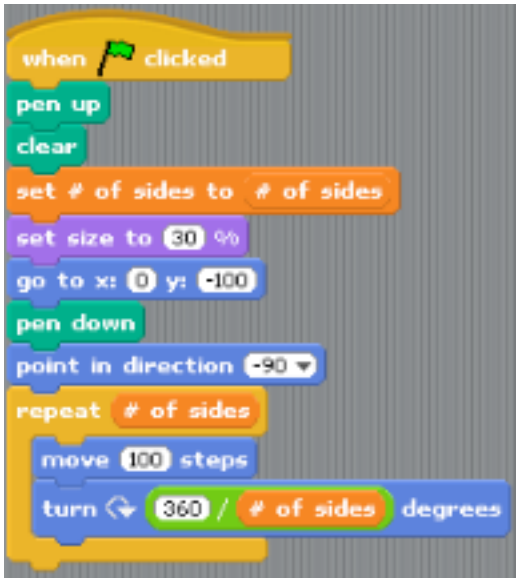
regular polygon	size by a percent	coordinate pair	quadrants
cardinal direction	degrees/angles	variable	range

1. How can you use **move** and **turn** to draw regular polygons?

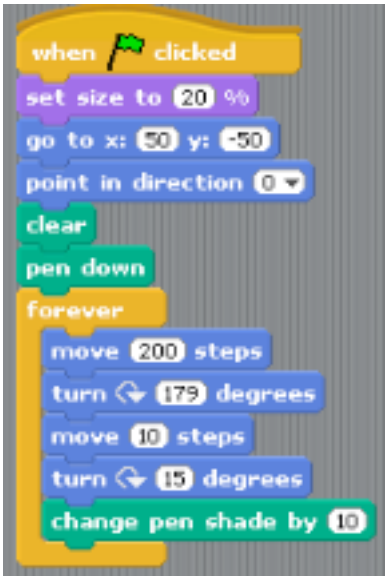


2. What is the relationship between the number of sides in a regular polygon and the number of degrees the sprite has to turn to form each angle?

3. How can a variable be used to create a script which draws polygons of **n** sides?
   a. Create a variable **# of sides**
   b. Check the variable's box to show it on screen.
   c, Set the variable's range by option/clicking on its screen readout.



4. How can explorations of steps and turns create spirograph designs?

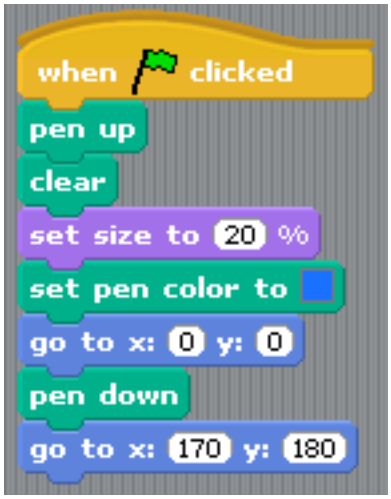


Scratch Geometry Explorations--Coordinate Geometry

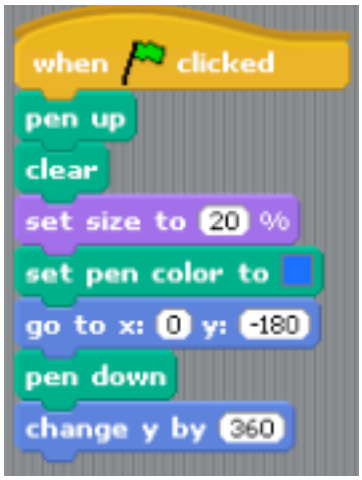
Quadrant ordered pair x coordinate, y coordinate X-axis, Y-axis origin

1. What is the default location of the cat when you open a project? How does that location change when you drag the cat to other places on the screen?

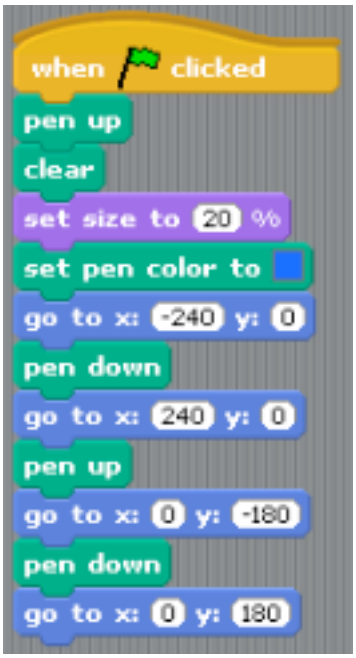
2. How can you draw lines by changing the x and/or y coordinate for the location of a sprite?



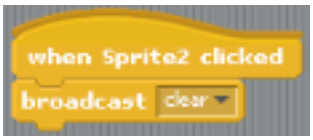
3. How can you draw a line by changing one coordinate?



4, How can you draw the x and y axis of the coordinate grid by using coordinate pairs?



4. Here are directions to make a button that clears the screen and redraws the axis.
   a. Make a new sprite to be the button.
   b. Draw a costume for it naming the function of the button, then position the button to the side.
   c. Write a script for this sprite so that when it is clicked, it broadcasts to sprite1.



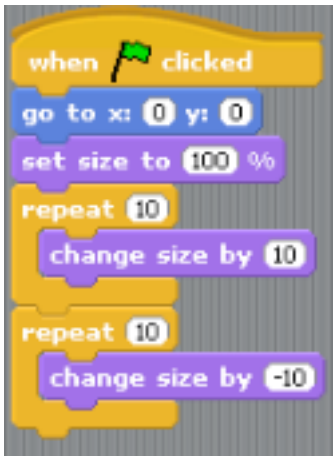
   d. In Sprite1, copy the grid script and replace the flag block with **when I receive** the broadcast.

5. How can you use coordinate pairs to draw specific shapes, such as your initials?
   a. Start with a new script in Sprite1.
   b. Make a Sprite3 to be the button that runs the script.

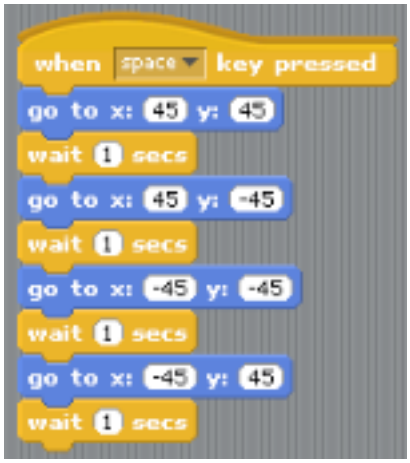
Scratch Math Explorations: Some Programming Concepts

Percentage	Positive and negative numbers	Coordinate geometry
Sequence (order of events)	Iteration (looping)	Random numbers
Threads (parallel events)	Synchronization (timing events using broadcast)	

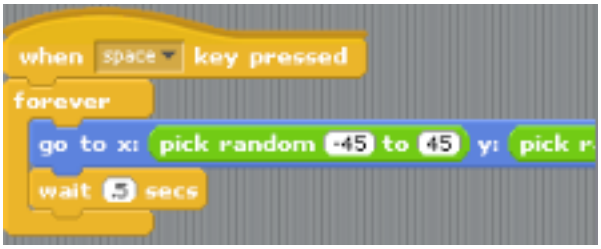
1. How does changing the size % affect the size of the cat?



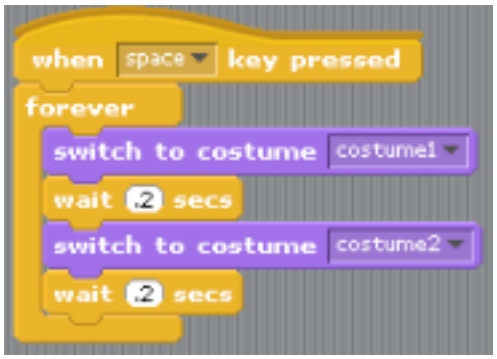
2. How can you use ordered pairs to change the location of the cat, to make it dance?



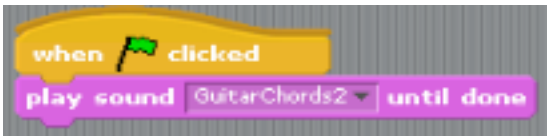
3. How can you use random numbers to change the dance to "jazz"?



4. How can you animate the cat while it dances?



5. How can you add music for the dance?



6. How can you combine different moves and music?