

Name: \_\_\_\_\_ Andrew Id: \_\_\_\_\_

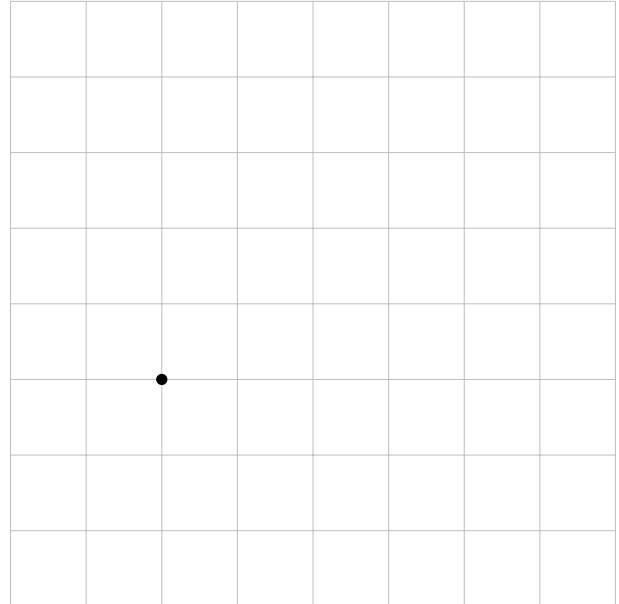
### 15-112 Fall 2021 Quiz 2

Up to 20 minutes. No calculators, no notes, no books, no computers, no other people. Take this quiz in 20 minutes (time yourself) and upload your work when done. All students who make a real attempt will receive full marks. (So there is no benefit to cheating.) Show your work when relevant.

1. (3 points) **Code Tracing:** Indicate what the following program draws. Place your answer on the grid to the right of the code. You may assume that each square in the grid is 50 units wide and 50 units high. You may also assume that the turtle starts on the black dot, facing to the right. (Note that the grid lines are provided for your reference. You may assume that they do not appear in the actual, final picture.)

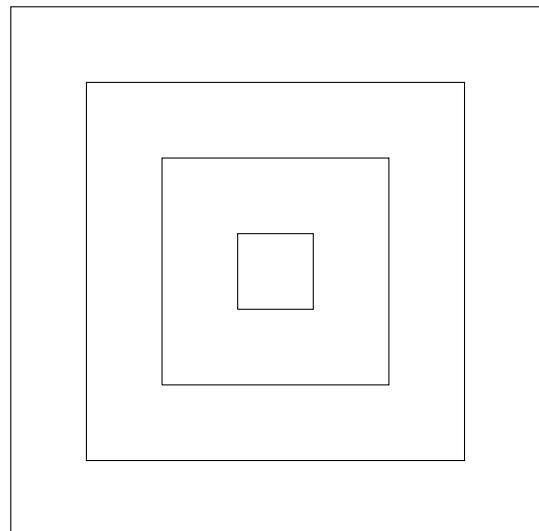
```
def CT1():  
    forward(150)  
    left(90)  
    forward(100)  
    right(180)  
    forward(200)  
    left(180)  
    forward(50)  
    circle(50)
```

CT1()



2. (3 points) **Reasoning Over Code** Consider the following code and picture:

```
def drawSquare(a):  
    for i in range(4):  
        forward(a)  
        left(90)  
  
def turtleROC(x, y):  
    s = 50  
    for i in range(x):  
        drawSquare(s)  
        s += y  
        penup()  
        forward(-y/2)  
        right(90)  
        forward(y/2)  
        left(90)  
        pendown()
```

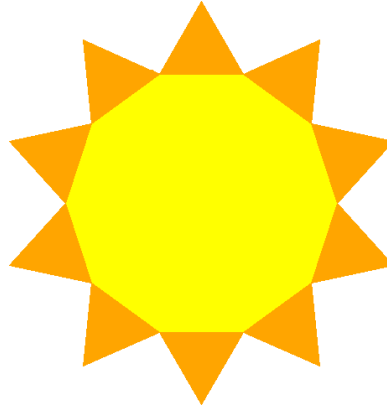


Find values for  $x$  and  $y$  that cause the function `turtleROC` to produce the picture. Write the correct values, and only those, on the appropriate lines below:

$x =$  \_\_\_\_\_

$y =$  \_\_\_\_\_

3. (12 points) **Free Response:** Write python code using the turtle library to produce the image given below. The orange triangles are equilateral, with each side being 50 pixels. The yellow center is not a circle, it is a ten-sided polygon. You may write any additional helper functions that you need.



```
def drawSun():  
    # You can assume that turtle library is already imported  
    # Your code goes here.
```