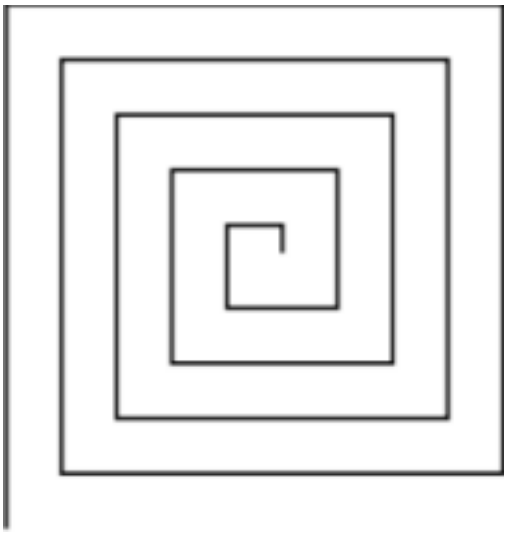
Homeworks – Lecture 4

More drawing exercises:

1. How can you draw a circle? Turtle knows only straight lines, how it could be turned into circles? If you have no idea, jump into the next exercise and after that come back with renewed vigor.

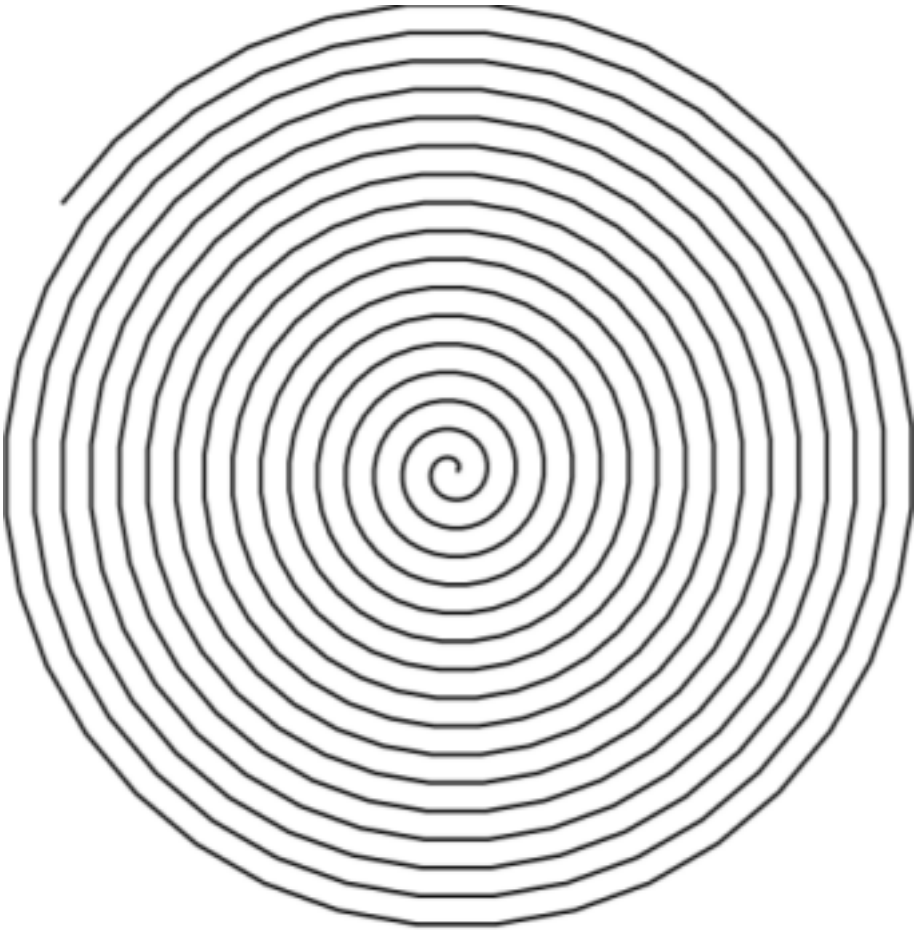
2. Draw an 95-gon.

3. Draw this ornament.



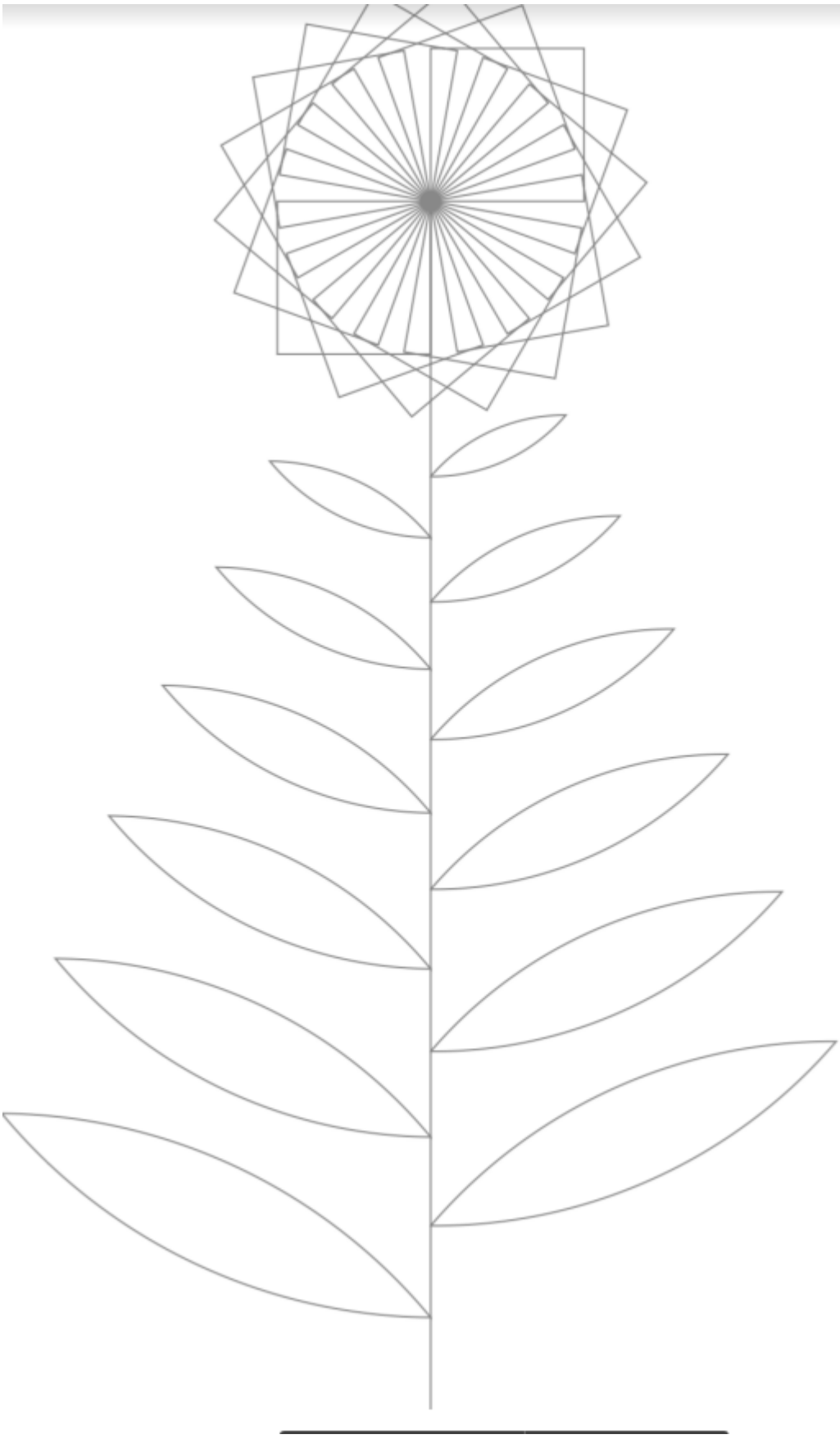
If you don't know, measure the length of the sides. And also start from the inner part.

4. Draw a spiral



From ornaments to the spiral you can go the same way as from n-gons to circles.

5. NOT A MANDATORY HOMEWORK: if you like drawing, try to draw a flower like in the image below. Try to use for-loop as much as possible and not use Ctrl+C, Ctrl+V



Now it's time to practice for loops!

6. Using a for loop, write a program which return this:

Row 0
Row 1
Row 2
Row 3
Row 4

7. Using a cycle, write a program which return this:

0 to power of 2 is 0
1 to power of 2 is 1
2 to power of 2 is 4
3 to power of 2 is 9
4 to power of 2 is 16
How do you name variables of the cycle?

8. Using a cycle and 'end' parameter of print function, write a program which returns a following table from single 'X' characters (you should not use string "X X X X X"):

X X X X X
X X X X X
X X X X X
X X X X X
X X X X X

And now more loops:

More mathematical operations. If you are not sure about the correct mathematical solution, focus on programming and simply force the computer to do what you want from it. All of them can be solved using loops as we spoke about (**for** or **while**).

9) Sum of numbers divisible by 3 and 5.

Taking numbers smaller than 10 divisible (without remainder) by 3 or 5, we will get 3, 5, 6, 9. Their sum is 23. What is the sum of the numbers divisible (without remainder) by 3 or 5 in intervals from 0 to 100?

10) Prime numbers

In the list of prime numbers (2, 3, 5, 7, 11, 13) we see that the sixth prime number is 13. What is the hundredth one? And which one is in the 10 thousand?

11) Number division

2520 is the smallest number which is divisible by all numbers from 1-10. Find the smallest positive whole number which is divisible by numbers from 1-20.

12) Fibonacci number sequence

A Fibonacci sequence is the integer number sequence of 0, 1, 1, 2, 3, 5, 8...

The first two numbers are 0 and 1. All other terms are obtained by adding the preceding two numbers. This means to say the nth number is the sum of (n-1)th and (n-2)th number. Write a code which will print the first 20 sequence numbers. If you have more time, change it to ask the user for input, how many steps he wants to see.

13) What happens if you leave a blank body of a cycle?

14) Change the Rock, Scissors, Paper to repeat the game until the user enters the "end".

Results of mathematical exercises

- Sum of numbers from 0-100 divisible by 3 and 5 is 2318
- Hundredth prime number is 541
- Ten thousandth prime number is 104729
- The smallest number divisible without remainder by all numbers between 1-20 is 232792560