Introducing Strings, Conditionals, and Iteration

1. Fizz buzz is a classic intro programming problem. The problem is as follows:

Write a program that prints the numbers from 1 to n, but for multiples of three print *Fizz* instead of the number and for the multiples of five print *Buzz*. For numbers which are multiples of both three and five print *FizzBuzz*.

1. Write a function that counts the number of times a word appears in a text, given the text as a string and the desired words.
2. Write a function that prints the first n prime numbers.
3. Approximate the area under the sine function from [0, pi].

*Suggestion*: Can you think of a way to do this using random numbers and without using geometric approximation/calculus?

1. Given a polynomial represented as a list of coefficients (how can we do this?), and a given x, evaluate the function at that point.
2. Write a function that uses the bisection method to find the x value that gives the root of a polynomial f(x) within a particular x interval provided a tolerance, when the polynomial represented as a list, a lower bound, and an upper bound for the x interval are input. Complete problem assuming one root.
3. Take a circle of radius 1. Within the circle, inscribe an equilateral triangle. Then, within the triangle, inscribe new smaller circle. Within the smaller circle inscribe a regular square, and within the square, inscribe yet another circle. Within the smaller circle inscribe a regular pentagon, and within the pentagon, inscribe yet another circle. Iterate this process of inscribing regular polygon and a new smaller circle, increasing the number of sides of the polygon by 1 each time.

What is the radius of the limiting circle?