Bertrand Paradox

Gareth Tribello
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An interesting problem in probability theory is the so-called Betrand Paradox, which you can read about here:

https://en.wikipedia.org/wiki/Bertrand_paradox_(probability)

As the article explains the Betrand paradox concerns an equilateral triangle inscribed in a circle. A chord of the circle is chosen at random and we are asked to determine the probability that the chord is longer than a side of the triangle. The interesting thing about this problem is that the answer we get for the probability depends on the manner in which the chord is randomly selected.

Write a project for your portfolio on the Betrand paradox in which you confirm that the different methods for generating the chords give different estimates for the probability. To do this I would like you to write Monte Carlo codes that generate random chords and that estimate the probability that will be similar to those that you have written for estimating π and for calculating the area of the Mandelbrot set. Discuss how your degree of certainty that you are sampling from different distributions when you generate chords in different ways depends on the number of samples that you take from the distributions.