

Ein paar Keksprobleme

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0.1 Approximation of π with cooked Spaghetti

Consider a square with edges of length $L \in \mathbb{R}_{\geq 0}$. If we now consider cooked spaghetti of length $\ell \leq L$ and throw this cooked spaghetti into the square. Assume this can be modeled as a random walk of length ℓ from one endpoint of the spaghetti.

Can we approximate π by the average number of intersections a spaghetti has with the square.

PROOF: For more than 100 steps, the probability distribution for the random walk to end at a specific point is a function of the distance to the origin. This is given by a Raylight distribution

$$P(r) = \frac{2r}{N} e^{-r^2/N} \quad (0.1.1)$$

here the step length was 1.

Assuming now that this step length is ℓ , we get

$$P(r) = \frac{2r}{N\ell} e^{-\frac{r^2}{N\ell}} \quad (0.1.2)$$

□