HOMEWORK No. 1

H1 [Probability of a Triangle]

This is a pretty common "interview" probability question.

Suppose we have an interval of length 1. We throw two darts at the interval independently and uniformly at random, *i.e.,* the position of each dart lands corresponds to a random variable distributed Uniform$(0, 1)$. The two darts divide our interval into three segments. We want to know the probability that these three segments form a triangle.

(a) Describe the criterion we need in order to achieve our goal.

(b) If the first dart lands at $x \in [0, \frac{1}{2}]$, what's the probability that the resulting segments give us a triangle.

(c) What is the probability that the 3 segments form a triangle?

Textbook: Problems 6.2, 6.4, 7.4, 7.5