

Probability theory and mathematical statistics

Excercises 2.

1. On a rectangular target with sides of one meter length each a circle is drawn with radius of $\frac{1}{2}$ meter. Find the probability that a random shot (given it hits the target) hits the target outside the circle.
2. Two people agree to meet between 2:00 P.M. and 3:00 P.M., with the understanding that each will wait no longer than 15 minutes for the other. What is the probability that they will meet?
3. Determine the probability that the distance between two points chosen on a line segment of length 1 is greater than $\frac{1}{3}$.
4. In 24 hours time two ships arrive independently into a harbour, denoted by A and B , respectively. Ship A can be unloaded in an hour, while ship B in two hours. Workers start to unload a ship immediately after its arrival and if the other ship arrives before they finish it has to wait. What is the probability that none of the ships has to wait?
5. A stick of length one meter is randomly broken into three parts. What is the probability that from the obtained parts a triangle can be formed?
6. Choose two points randomly from the $[0, 1]$ interval. Find the probability that the distance of the two points is less than the distance between the point 0 and the chosen point which is closer to 0.
7. Choose randomly two positive numbers less than 1. What is the probability that their geometric mean is less than $\frac{1}{2}$?
8. Choose randomly two positive numbers less than 1. What is the probability that their sum is less than 1 and their product is less than $\frac{2}{9}$?