Recitation 7

ENEE324: Engineering Probability

Spring, 2018

The following problems are from the textbook.

Problem 3.2.5.
Consider a triangle and a point chosen within the triangle according to the uniform probability law. Let X be the distance from the point to the base of the triangle. Given the height of the triangle, find the CDF and the PDF of X.

Problem 3.2.7.
Alvin throws darts at a circular target of radius r and is equally likely to hit any point in the target. Let X be the distance of Alvin's hit from the center.

1. Find the PDF, the mean, and the variance of X

2. The target has an inner circle of radius t. If $X \leq t$, Alvin gets a score of $S = 1/X$. Otherwise his score is $S = 0$. Find the CDF of S. Is S a continuous random variable?

Problem 3.3.13.
A city's temperature is modeled as a normal random variable with mean and standard deviation both equal to 10 degree Celsius. What is the probability that the temperature at a randomly chosen time will be less than or equal to 59 degrees Fahrenheit?

Problem 3.3.15.
A point is chosen at random (according to a uniform PDF) within a semicircle of the form $\{(x, y) \,|x^2 + y^2 \leq r^2, y \geq 0\}$, for some given $r > 0$.

1. Find the joint PDF of the coordinates X and Y of the chosen point.

2. Find the marginal PDF of Y and use it to find $\mathbf{E}[Y]$

3. Check your answer in (b) by computing $\mathbf{E}[Y]$ directly without using the marginal PDF of Y.