Homework due **Sep 15 Mon** in class. Problems with $*$ are recommended but not required.

- Reading: Textbook[1] Chapter 2.2.
- Hand-in Problems: several problems below require calculating integral and double integrals. **Show full steps in a clear manner.**

  1. Textbook Chapter 2.2, Exercise
     4 (a), (d)
     8 (a)–(e), (i)
     16 *Hint:* Try the following question first: the probability that three random points lie in the same semicircle, is the same as the probability that B and C (as in the hint from the original problem) *lie in what region*? Identify the region and then change the problem into a double integral. It is OK if you cannot give a rigorous argument on your choice of the region.
  2. Let X and Y be two independent exponential random variables with parameters λ_1 and λ_2, respectively.
     (a) What is the probability that $X > Y$?
     (b) Compute the cumulative distribution function of $\min(X, Y)$. Do you recognize the distribution of $\min(X, Y)$?
     Solve the two problems by first translating them into calculation of double integrals.

- Not hand-in Problems: (choose one from the following two sets)

  1. Textbook Chapter 2.2, Exercises 3, 5, 12*, 13.
  2. SOA/CAS Exam P/1 Sample Questions[2], 11–12, 14–16, 34, 40.

[1] *Introduction to Probability, Second Revised Edition*, Grinstead and Snell. See textbook website for solutions of odd-number exercises.

[2] SOA/CAS Exam P/1 Sample Questions. See course website for samples and solutions.