Homework assignment #1

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Definitions

Problem 1. (5 points)

Write down the definition of *independence* of two *events*.

Problem 2. (5 points)

Write down the definition of the *cumulative distribution function* of a random variable.

Problems

Problem 3. (9 points)

Let $\Omega = \{a_1, a_2, a_3, a_4, a_5\}$ be an outcome space, and let $\mathbb{P}$ be a probability on Ω. Assume that $\mathbb{P}[A] = 0.5$, $\mathbb{P}[B] = 0.4$, $\mathbb{P}[C] = 0.4$, and $\mathbb{P}[D] = 0.2$, where

$$A = \{a_1, a_2, a_3\}, \ B = \{a_2, a_3, a_4\},$$
$$C = \{a_3, a_5\} \text{ and } D = \{a_4\}.$$

Are the events A and B independent? Why?

Textbook problems

Problem 4. (4 points)

Solve **Problem 3.4** from the textbook.

Problem 5. (4 points)

Solve **Problem 3.6** from the textbook.

Problem 6. (a-e are 2 points each; f is 5 points=15 points total)

Solve **Problem 3.8** from the textbook.

Problem 7. (4 points)

Solve **Problem 3.20** from the textbook.

Problem 8. (4 points)

Solve **Problem 3.22** from the textbook.