4.10: Properties of the Cumulative Distribution Function

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December 6, 2024

1 Motivation

We want to define and explore the properties of the cumulative distribution function.

2 Content

Definition: (CDF) The **cumulative distribution function** of a random variable X, $F(b)$ is the probability that X takes on a value less than or equal to b.

Proposition: Some properties of the CDF are:

1. F is non-decreasing
2. $\lim_{b\to\infty} F(b) = 1$
3. $\lim_{b\to-\infty} F(b) = 0$
4. F is right continuous. For any b and any decreasing sequence b_n that converges to b, $lim_{n\to\infty} F(b_n) = F(b)$