

Stochastic Processes and Probability Theory III

Assignment #1. Due Friday, April 10

1. Let X_1, X_2, \dots be independent identically distributed (i.i.d.) random variables having a normal distribution with mean μ and variance σ^2 . Find the limiting distribution of

$$\bar{X} = \frac{X_1 + \dots + X_n}{n}$$

That is, if $F_n(x) = P[X_n \leq x]$ find a distribution function F such that $F_n \Rightarrow F$.

2. Let X_1, X_2, \dots be i.i.d. with a continuous distribution having density $f(x) = e^{-(x-\theta)}$ for $\theta < x < \infty$ and zero elsewhere. Let $W_n = \min(X_1, X_2, \dots, X_n)$. Find the limiting distribution of $Z_n = n(W_n - \theta)$.
3. Problem 25.6 from the text.
4. Problem 25.9 from the text.