Part I

Cheat Sheet

Chapter 1

Distributions

1.1 Discrete Distributions

1.2 Continuous Distributions

1.2.1 Continuous Uniform Distribution

Definition 1.

$$\mathbb{P}(B) = \frac{\lambda(A \cap B)}{\lambda(B)} \qquad B \in \mathfrak{B}_{\mathbb{R}} \tag{1.1}$$

Lemma 1.1.

Proof. By definition, we have

$$\varphi^{U([a,b])}(u) = \int_{\mathbb{R}} e^{iux} \mathbb{P}(dx) \tag{1.2}$$

$$= \int_{\mathbb{R}} e^{iux} \frac{1}{b-a} \mathbb{1}_{[a,b]}(x) dx \tag{1.3}$$

$$= \frac{1}{b-a} \int_{b}^{a} e^{iux} dx \tag{1.4}$$

Part II

Script

Chapter 2

Probability Space

Chapter 3

Independence

Chapter 4

Expected Value

Chapter 5

Characteristic Function