

PART I:

HOMEWORK # 6

1] Section 4.2: 1, 2.

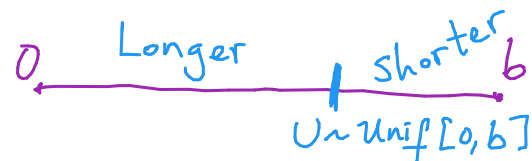
2] Section 4.3: 2, 3.

3] Section 4.4: 1, 2, 3, 4, 5. Hint for problem ②:

write $T'(a)T'(b)$ as a double integral and set $u=x+y$, $v=\frac{x}{x+y}$.

4] Section 4.14: 2, 5, 12, 17(a)

5] A point is chosen at random on a line segment of length $b > 0$. Find the probability that the ratio of the shorter to the longer segment is less than $1/4$.



6] Find the expectation and variance of the following random variables: $X \sim \mathcal{N}(\mu, \sigma^2)$, $Y \sim T(\lambda, t)$, $Z \sim \text{Beta}(a, b)$.

PART II:

7] Let $X \sim \mathcal{N}(12, 4)$. Use a standard normal table to find

(a) the probability that X differs from 12 by more than $\sigma = 2$.

(b) the value of $c \in \mathbb{R}$ such that $\mathbb{P}(X > c) = 0.1$.

8] Section 4.5: 4, 5, 7, 9.

9] Section 4.6: 2, 3, 4, 5, 6, 9.

10] Section 4.7: 1, 2, 4, 5, 8, 10, 11, 14.