

Mathematics 1550H – Probability I: Introduction to Probability

TRENT UNIVERSITY, Summer 2023 (S62)

Quiz #4

Continuous Probability

Due just before midnight on Tuesday, 4 July.*

Instructions: Do all of the following problems. Please show all your work.

$$\text{Let } f(x) = \begin{cases} 1/x^2 & x \geq 1 \\ 0 & x < 1 \end{cases}.$$

1. Verify that $f(x)$ is a valid probability density function. [2]

Suppose that $f(x)$ (as given above) is the probability density function of some random process (technically, of a continuous random variable). Suppose $A = [-3, 3] \cup [6, 12]$ is the event that the process (or random variable) returns a value between -3 and 3 or between 6 and 12 , and that $B = [2, 9]$ is the event that the process (or random variable) returns a value between 2 and 9 .

2. Compute $P(B|A)$ and $P(A|B)$. [3]

* You should submit your solutions via Blackboard's Assignments module, preferably as a single pdf. If this fails, you may submit your work to the instructor on paper or by email to sbilaniuk@trentu.ca.