

Mathematics 1550H – Probability I: Introduction to Probability

TRENT UNIVERSITY, Summer 2020 (S62)

Quiz #6

Tuesday, 28 July

Available on Blackboard from 12:01 a.m. on Tuesday, 28 July.

Due on Blackboard by 11:59 p.m. on Tuesday, 28 July.

Solutions will be posted on Thursday, 30 July.

Scans of photos of handwritten work are entirely acceptable so long as they are legible and in some common format; solutions submitted as a single pdf are preferred, if you can manage it. If you can't submit your solutions via Blackboard's Assignments module for some reason, please email them to the instructor at: sbilaniuk@trentu.ca

Reminder: Per the course outline, all work submitted for credit must be written up entirely by yourself, giving due credit to all relevant sources of help and information. For the quizzes, you are permitted to use your textbook and all other course material, but you may not use any other sources or aids, nor give or receive any help, except to ask the instructor to clarify questions and to use a calculator (any that you like).

We roll a fair standard die 100 times, each roll being independent of all the others. For $1 \leq i \leq 100$, let the random variable X_i give the number on the face that comes up on the i th die roll. Let $X = \sum_{n=1}^{100} X_n = X_1 + X_2 + \cdots + X_{100}$ be the total sum of all the die rolls.

1. Compute the expected value $E(X_i)$ and variance $V(X_i)$ of X_i . [1]
2. Compute the expected value $E(X)$ and variance $V(X)$ of X . [1]
3. Approximate $P(400 \leq X \leq 500)$ using the standard normal distribution. [3]

Show all your work!