

TRENT UNIVERSITY, WINTER 2018
MATH-CCTH 1080H Test #2
~~Tuesday, 13~~ Friday, 16 March
Time: 60 minutes

Instructions

- Show all your work. Legibly, please!
- If you have a question, ask it!
- Use the back sides of the test sheets for rough work or extra space.
- You may use a calculator and an aid sheet.

1. Do *any two* (2) of **a–c**. [10 = 2 × 5 each]

- a. A non-standard fair four-sided die has faces numbered 0, 1, 3, and 6. What is the expected value of the number that comes up on a single roll of this die?
- b. The continuous random variable X has $f(x) = \begin{cases} 1 & 2 \leq x \leq 3 \\ 0 & x < 2 \text{ or } x > 3 \end{cases}$ as its probability density function. What is the expected value of X ?
- c. A fair coin is tossed twice and the random variable Y counts the number of heads that come up. Compute the expected value $E(Y)$ and variance $V(Y)$ of Y .

2. Do *all three* (3) of **a–c**.

Consider the following data: 2, 2, 3, 5, 6, 7, 7, 7, 8, 9

- a. Find the mean, median, and mode of the given data. [3]
- b. Find the standard deviation of the given data. [4]
- c. Suppose the data gives the number of heads that came up in ten different sets of ten tosses each of a coin. Is the coin biased or not? Explain why or why not as fully as you can. [3]

3. Do *one* (1) of **a** or **b**. [10]

- a. The graph on the right tracks the annual revenue [money coming in] of Company, Inc. It is the only data presented to the shareholders at the February 2018 annual meeting. Is there anything the shareholders should be concerned about?



- b. If you were to pick an answer to this question at random from among the choices below, what is the probability that it would be correct? Explain your answer!

(1) 0.2 (2) 1/5 (3) 0% (4) 4/10

[Total = 30]