

## Mathematics 1550H – Probability I: Introduction to Probability

TRENT UNIVERSITY, Summer 2020 (S62)

### Quiz #3

Tuesday, 7 July.

Available on Blackboard from 12:01 a.m. on Tuesday, 7 July.

Due on Blackboard by 11:59 p.m. on Tuesday, 7 July.

Solutions will be posted on Thursday, 9 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](mailto: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).

Recall that a standard 52-card deck has four *suits*,  $\heartsuit$ ,  $\diamondsuit$ ,  $\clubsuit$ , and  $\spadesuit$ , each of which has 13 cards, one each of the following *kinds*,  $A, K, Q, J, 10, 9, 8, 7, 6, 5, 4, 3$ , and  $2$ . A hand of seven (7) cards is drawn at random from such a deck. (This means that you get the cards as a group, in no particular order, and with no possible way of getting the same card twice in the hand.) Find the probability that the hand ...

1. ... is a *flush*, *i.e.* all the cards in the hand are from the same suit. [1]
2. ... has four cards of the same kind. [1]
3. ... has exactly three cards of one kind, two cards of another kind, and two cards of yet another kind. [1]
4. ... has cards of seven different kinds. [1]
5. ... is a *straight*, *i.e.* a set of cards that can be arranged to be consecutive with no gaps in the sequence  $A K Q J 10 9 8 7 6 5 4 3 2$ , where we allow the sequence to wrap around the end. (So  $3 2 A K Q J 10$  would count as a straight, for example.) [1]

Show all your work!