

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

TRENT UNIVERSITY, Summer 2023 (S62)

**Quiz #11**

**A Joint Distribution**

*Due\* just before midnight on Thursday, 27 July.*

**Instructions:** Do the following problem. Please show all your work.

1. Suppose the discrete random variables  $X$  and  $Y$  are jointly distributed according to the given table.

- a. Compute the expected values  $E(X)$  and  $E(Y)$ , the variances  $V(X)$  and  $V(Y)$ , and also the covariance  $\text{Cov}(X, Y)$  of  $X$  and  $Y$ . [3.5]

$Y \backslash X$	0	1	2
1	0.2	0.2	0.2
2	0.2	0	0.1
3	0	0.1	0

- b. Determine whether  $X$  and  $Y$  are independent. [0.5]

- c. Let  $T = X - Y$ . Compute  $E(T)$  and  $V(T)$ . [1]

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\* 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](mailto:sbilaniuk@trentu.ca).