## Mathematics 1550H – Probability I: Introduction to Probability
Trent University, Summer 2023 (S62)
### Quiz #9
### Reverse Engineering?
*Due* just before midnight on Thursday, 20 July.*

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

1. Suppose $X$ is a continuous random variable. Find an example of a probability density function for $X$ giving expected value $E(X) = 1$ and variance $V(X) = 3$ if $X$ has ...
   
   **a.** a uniform distribution. *[1]*
   
   **b.** an exponential distribution. *[1]*
   
   **c.** a normal distribution. *[1]*
   
   In each case, if there is no such probability density function, explain why this is so.

2. Is it possible to have a uniform probability distribution and an exponential probability distribution such that the continuous random variables with these distributions would have the same expected value and variance? Give an example demonstrating that this is possible or an explanation of why this is impossible. *[2]*