Mathematics 1550H – Probability I: Introduction to Probability
Trent University, Summer 2023 (S62)
Assignment #4
A Continuous Grind
Corrected the density function on 2023-07-08.
Due* just before midnight on Friday, 14 July.

Suppose X is a continuous random variable whose probability density function is
$$f(x) = \begin{cases} xe^{-x} & x \geq 0 \\ 0 & x < 0 \end{cases}.$$

1. Verify that $f(x)$ is indeed a valid probability density function. *[1.5]*

2. Compute the expected value $E(X)$ of X. *[1.5]*

3. Compute the variance $V(X) = E\left(X^2\right) - [E(X)]^2$ of X. *[2]*