MTH 102: Probability and Statistics

Quiz 3

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I. QUESTION 2

We start two independent clock timers, namely Analog and Digital. Let random variable X denote the expiry time of Analog and Y denote the expiry time of Digital. X is uniformly distributed with PDF $f_X(x) = 1/T$, $0 \leq x \leq T$, and Y is exponentially distributed with PDF $f_Y(y) = \mu e^{-\mu y}$, $y \geq 0$. Let Z be the random variable that gives the time at which the first of the two timers expires. Calculate the complementary CDF $P[Z > z | X = x]$ for $z \in (-\infty, \infty)$. Sketch the CCDF. [Hint: Use the fact that X and Y are independent. Note X is set to x.]

Finally, calculate $E[Z | X = x]$