Applying the Central Limit Theorem

Math 445, Spring 2017

Example 1

Consider a Gamma random variable with parameters $r = 1200$ and $\lambda = 1/3$. Approximate the probability that this Gamma random variable exceeds 3500. (Hint: This Gamma random variable can be expressed as a sum of independent random variables.)

Example 2

Suppose that $X_1, \ldots, X_{500}$ are independent Geometric random variables, each of which have $E(X_i) = 8/5$. Let $T = X_1 + \cdots + X_{500}$.

a. What are the expected value, variance, and standard deviation of T?

b. Find a good approximation for $P(780 < T < 820)$. (You may leave this in terms of $\Phi(\cdot)$.)