1. The random variable X is is distributed as a Pareto distribution given a parameter θ and a parameter $\alpha = 3$. θ follows a gamma distribution with parameters $\alpha = 2$ and $\theta = 3$.

    Calculate Var(X).

2. Losses are distributed as a two point mixture distribution of Gamma distributions.

The first Gamma distribution with parameters of $\alpha = 4$ and $\theta = 2$ has a weight of 0.75.

The second Gamma distribution with parameters of $\alpha = 4$ and $\theta = 10$ has a weight of 0.25.

Use the normal approximation to determine the probability that the sum of 100 independent claims will exceed 1750.