

147. Key: A

Let X denote the amount of a claim before application of the deductible. Let Y denote the amount of a claim payment after application of the deductible. Let λ be the mean of X , which because X is exponential, implies that λ^2 is the variance of X and $E(X^2) = 2\lambda^2$.

By the memoryless property of the exponential distribution, the conditional distribution of the portion of a claim above the deductible given that the claim exceeds the deductible is an exponential distribution with mean λ . Given that $E(Y) = 0.9\lambda$, this implies that the probability of a claim exceeding the deductible is 0.9 and thus $E(Y^2) = 0.9 \cdot 2\lambda^2 = 1.8\lambda^2$. Then,
$$\text{Var}(Y) = 1.8\lambda^2 - (0.9\lambda)^2 = 0.99\lambda^2.$$