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Let $Y \mid X = k \sim \mathcal{P}(k)$ be a Poisson distributed random variable conditional on the value of X. Further suppose that

$$P(X = k) = (1 - p)^k p, \quad k \in \mathbb{N}_0,$$

for $p \in (0, 1)$ with $\mathrm{E}(X) = \frac{1-p}{p}$ and $\mathrm{Var}(X) = \frac{1-p}{p^2}$.

Find the missing numerical values with a precision of two decimals. **3 of 3 points**

1 of 1 point

(a) Derive the expectation and variance of Y for $p = \frac{1}{3}$.

$\mathrm{E}(Y) =$

2 ✓

1 of 1 point

$\mathrm{Var}(Y) =$

8 ✓

1 of 1 point

(b) Denote by $p_{\min}$ the smallest $p \in (0, 1)$, such that $P(Y = 0) \geq \frac{1}{3}$. Find $p_{\min}$ with a precision of two decimals.

Hint: Use the law of total probability.

$p_{\min} =$

0.24 ✓

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Create an inspection request?

Please note that this document will become a part of your exam file!
- Be polite and friendly.
- Describe your rationale as precisely as possible.

Dynexite, 30.07.2021

Request for correction of this item

Dear sir or madam, ...

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