ANSWER TO QUESTION #86836 – MATH – STATISTICS AND PROBABILITY

QUESTION

For a Poisson distributed random variable X, P(X = 4) = P(X = 5).Find the mean and variance of the distribution.

SOLUTION

Let the parameter of Poisson random variable X be λ.

$X \sim P(\lambda)$ *then* $P(X=r)=\frac{e^{-\lambda}\lambda^{r}}{r!}, r=0,1,2,.....$

given $P(X=4)=P(X=5)$

$$\Rightarrow \frac{e^{-\lambda}\lambda^{4}}{4!}=\frac{e^{-\lambda}\lambda^{5}}{5!}\Rightarrow \lambda=\frac{5!}{4!}=\frac{5(4!)}{4!}=5$$

$mean\ of\ X=E(X)=\lambda=5$

$variance\ of\ X=V(X)=\lambda=5$

ANSWER: 5; 5.