Book : Grimmett

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A random variable X has the distribution $B(12, p)$.

(a) Given that $p = 0.25$ find

    (i) $P(X < 5)$

    (ii) $P(X \geqslant 7)$

(b) Given that $P(X = 0) = 0.05$, find the value of p to 3 decimal places.

(c) Given that the variance of X is 1.92, find the possible values of p.

The number of houses sold by an estate agent follows a Poisson distribution, with a mean of 2 per week.

(a) Find the probability that in the next 4 weeks the estate agent sells,

    (i) exactly 3 houses,

    (ii) more than 5 houses.

(5)

The estate agent monitors sales in periods of 4 weeks.

(b) Find the probability that in the next twelve of these 4 week periods there are exactly nine periods in which more than 5 houses are sold.

(3)

The estate agent will receive a bonus if he sells more than 25 houses in the next 10 weeks.

(c) Use a suitable approximation to estimate the probability that the estate agent receives a bonus.

(6)