2.2 Further Statistics: Poisson and Geometric Distributions: 10-minute Pack

AQA 7367 · Calculator allowed · about 10 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Customers arrive at the till of a small bakery in Falmouth singly and at random, independently of each other, at a constant average rate of 3.2 customers per 10-minute interval.

(a) Find the probability that exactly 5 customers arrive during a 10-minute interval. **(2)**

(b) Find the probability that at most 2 customers arrive during a 5-minute interval. **(3)**

(c) Find the probability that no customers arrive during a 2-minute period. **(2)**

(Total for Question 1 is 7 marks)

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Mark scheme · 2.2 Further Statistics: Poisson and Geometric Distributions: 10-minute Pack

Question 1

(a) correct use of $P(X=5) = e^{-3.2} * 3.2^5 / 5!$ with $X \sim Po(3.2)$	**M1**
(a) awrt 0.114	**A1**
(a) Answer: P(X = 5) = awrt 0.114	
(b) scales the rate to a 5-minute interval, $\lambda = 1.6$	**M1**
(b) attempts $P(X=0)+P(X=1)+P(X=2)$ with $\lambda = 1.6$	**M1**
(b) awrt 0.783	**A1**
(b) Answer: P(X ≤ 2) = awrt 0.783	
(c) scales the rate to a 2-minute interval, $\lambda = 0.64$	**M1**
(c) awrt 0.527	**A1**
(c) Answer: P(X = 0) = awrt 0.527	

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