

AQA
Statistics 2
分类真题
2019-2022 册

A Level Clouds 出品

目录

Chapter 1 Poisson Distribution	1
Chapter 2 Continuous Random Variables	4
Chapter 3 Exponential Distribution	29
Chapter 4 Normal Distribution	38
Chapter 5 Estimation	47
Chapter 6 Hypothesis Test	59

Chapter 1

Poisson Distribution

- 3** Matthew is shooting arrows at a target.

The number of arrows hitting the target can be modelled by a binomial distribution with

$$n = 100 \text{ and } p = 0.01$$

- 3 (a)** Using a Poisson distribution as an approximation, estimate the probability that more than 3 arrows hit the target, giving your answer to three decimal places.

[3 marks]

Answer _____

- 3 (b)** State under what conditions the Poisson distribution is considered to be a good approximation to the binomial distribution.

[2 marks]

- 4 Let X represent the number of people arriving at a hospital with a particular disease in a day.

A random sample of 20 days is taken. The summarised data is

$$\sum x = 50 \quad \text{and} \quad \sum x^2 = 173$$

- 4 (a) Using the summarised data, explain why it would be reasonable to model X using a Poisson distribution.

[4 marks]

- 4 (b) Using a Poisson model with mean 2.5, find $P(X = 4)$, giving your answer to three significant figures.

[2 marks]

Answer _____

Chapter 2

Continuous Random Variables

3

The continuous random variable T has cumulative distribution function

$$F(t) = \begin{cases} 0 & t \leq 0 \\ kt^4 & 0 < t \leq 5 \\ 1 & t > 5 \end{cases}$$

3 (a)

Show that $k = \frac{1}{625}$

[2 marks]

3 (b)

State $P(T = 3)$

[1 mark]

Answer _____

3 (c) The constant c is such that $P(T \leq c) = 0.75$

Find c .

Give your answer to four significant figures.

[2 marks]

Answer

8

The continuous random variable X has probability density function

$$f(x) = \begin{cases} \frac{1}{32}x^3 & 0 < x \leq 2 \\ \frac{1}{8}x + \frac{1}{16} & 2 < x \leq 4 \\ 0 & \text{otherwise} \end{cases}$$

8 (a) Show that $E(X) = \frac{349}{120}$

[3 marks]

8 (b) Find $\text{Var}(X)$.

[5 marks]

Answer

8 (c) Find $\text{Var}(2X + 3)$.

[2 marks]

Answer

8 (d) Find the cumulative distribution function, $F(x)$, of X .

[7 marks]

Answer _____

1 The continuous random variable X_1 has mean 2 and variance 3

The continuous random variable X_2 has mean 5 and variance 1

The continuous random variable X_3 has mean 1 and variance 0.5

X_1, X_2 and X_3 are independent.

1 (a) Find $E\left(\sum_{i=1}^3 X_i\right)$

[1 mark]

Answer _____

1 (b) Find $\text{Var}\left(\sum_{i=1}^3 X_i\right)$

[1 mark]

Answer _____