

Discrete Random Variables Exam Questions

Q1 (OCR 4766, Jun 2016, Q4) [Modified]

The probability distribution of the random variable X is given by the formula

$$P(X = r) = \frac{k}{r(r-1)} \text{ for } r = 2, 3, 4, 5, 6.$$

- (i) Show that the value of k is 1.2. Using this value of k , show the probability distribution of X in a table. [3]
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Q2 (OCR 4766, Jun 2014, Q5) [Modified]

The probability distribution of the random variable X is given by the formula

$$P(X = r) = k + 0.01r^2 \text{ for } r = 1, 2, 3, 4, 5.$$

- (i) Show that $k = 0.09$. Using this value of k , display the probability distribution of X in a table. [3]
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Q3 (OCR 4766, Jan 2013, Q2) [Modified]

The probability distribution of the random variable X is given by the formula

$$P(X = r) = k(r^2 - 1) \text{ for } r = 2, 3, 4, 5.$$

- (i) Show the probability distribution in a table, and find the value of k . [3]
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Q4 (OCR 4766, Jan 2011, Q4) [Modified]

The probability distribution of the random variable X is given by the formula

$$P(X = r) = kr(r + 1) \text{ for } r = 1, 2, 3, 4, 5.$$

- (i) Show that $k = \frac{1}{70}$. [2]
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Q5, (Edexcel 6683, Jan 2007, Q3)

The random variable X has probability function

$$P(X = x) = \frac{(2x-1)}{36} \quad x = 1, 2, 3, 4, 5, 6.$$

- (a) Construct a table giving the probability distribution of X . (3)

Find

- (b) $P(2 < X \leq 5)$, (2)
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Q6, (Edexcel 6683, Jan 2008, Q7)

Tetrahedral dice have four faces. Two fair tetrahedral dice, one red and one blue, have faces numbered 0, 1, 2, and 3 respectively. The dice are rolled and the numbers face down on the two dice are recorded. The random variable R is the score on the red die and the random variable B is the score on the blue die.

(a) Find $P(R=3 \text{ and } B=0)$.

(2)

The random variable T is R multiplied by B .

(b) Complete the diagram below to represent the sample space that shows all the possible values of T .

3					
2		2			
1	0				
0					
<i>B</i>	<i>R</i>	0	1	2	3

Sample space diagram of T

(3)

(c) The table below represents the probability distribution of the random variable T .

t	0	1	2	3	4	6	9
$P(T=t)$	a	b	$1/8$	$1/8$	c	$1/8$	d

Find the values of a , b , c and d .

(3)

Q7, (Edexcel 6683, Jan 2011, Q6a,e-g)

The discrete random variable X has the probability distribution

x	1	2	3	4
$P(X = x)$	k	$2k$	$3k$	$4k$

(a) Show that $k = 0.1$

(1)

Two independent observations X_1 and X_2 are made of X .

(e) Show that $P(X_1 + X_2 = 4) = 0.1$

(2)

(f) Complete the probability distribution table for $X_1 + X_2$

(2)

y	2	3	4	5	6	7	8
$P(X_1 + X_2 = y)$	0.01	0.04	0.10		0.25	0.24	

(g) Find $P(1.5 < X_1 + X_2 \leq 3.5)$

(2)
