



Statistical Distribution : Probability Distribution - Edexcel Past Exam Questions

1. The random variable X has probability function

$$P(X = x) = kx, \quad x = 1, 2, \dots, 5.$$

- (a) Show that $k = \frac{1}{15}$. (2)

Find

- (b) $P(X < 4)$, (2)
Jan 05 Q4(edited)
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2. The random variable X has probability function

$$P(X = x) = \begin{cases} kx, & x = 1, 2, 3, \\ k(x+1), & x = 4, 5, \end{cases}$$

where k is a constant.

- (a) Find the value of k . (2)
June 05 Q5(edited)
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3. 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)
Jan 07 Q3(edited)
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4. The random variable X has probability distribution

x	1	3	5	7	9
$P(X = x)$	0.2	0.3	0.2	q	0.15

Find

- (a) the value of q , (1)
- (b) $P(4 < X \leq 7)$. (2)

June 07 Q7 (edited)

5. 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					
B	R	0	1	2	3

Sample space diagram of T

(3)

Jan 08 Q7 (edited)

6. The discrete random variable X has probability function

$$P(X = x) = \begin{cases} a(3-x) & x = 0, 1, 2 \\ b & x = 3 \end{cases}$$

- (a) Find $P(X = 2)$ and copy and complete the table below.

x	0	1	2	3
$P(X=x)$	$3a$	$2a$		b

(1)

Given that $b = 0.4$

- (b) find the value of a (2)

Find

- (c) $P(0.5 < X < 3)$, (2)

June 09 Q6 (edited)

7. The probability function of a discrete random variable X is given by

$$p(x) = kx^2, \quad x = 1, 2, 3.$$

where k is a positive constant.

- (a) Show that $k = \frac{1}{14}$. (2)

Find

- (b) $P(X \geq 2)$, (2)

Jan 10 Q5 (edited)

8. The discrete random variable X has probability distribution given by

x	-1	0	1	2	3
$P(X = x)$	$\frac{1}{5}$	a	$\frac{1}{10}$	a	$\frac{1}{5}$

where a is a constant.

- (a) Find the value of a . (2)

The random variable $Y = 6 - 2X$.

- (b) Calculate $P(X \geq Y)$. (3)
June 10 Q3 (edited)

9. 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 .

- (b) Show that $P(X_1 + X_2 = 4) = 0.1$ (2)

- (c) 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	

- (d) Find $P(1.5 < X_1 + X_2 \leq 3.5)$ (2)
Jan 11 Q6

10. The discrete random variable Y has the probability distribution

y	1	2	3	4
$P(Y = y)$	0.1	0.4	0.3	c

where c is a constant.

- (a) Find the value of c . (1)
- (b) Find $P(3Y + 2 \geq 8)$. (2)

June 11 Q3(edited)

11. A spinner is designed so that the score S is given by the following probability distribution.

s	0	1	2	4	5
$P(S = s)$	p	0.25	0.25	0.20	0.20

- (a) Find the value of p . (1)

Tom and Jess play a game with this spinner. The spinner is spun repeatedly and S counters are awarded on the outcome of each spin. If S is even then Tom receives the counters and if S is odd then Jess receives them. The first player to collect 10 or more counters is the winner.

- (b) Find the probability that Jess wins after 2 spins. (2)
- (c) Find the probability that Tom wins after exactly 3 spins. (4)
- (d) Find the probability that Jess wins after exactly 3 spins. (3)

June 11 Q8(edited)