Probability: exam questions

10 questions · 26 marks · mark schemes at the end

Name _____ Date _____ Score / 26

- Calculators are allowed on both 4MA1 Higher papers (1H and 2H). Show your working: most marks are for method.
- Mark schemes start after the questions. M marks are for a correct method, A marks for an accurate answer that follows a correct method, and B marks for a correct result on its own.
- Online, with more practice: igcsemathrevision.com/igcse-frontend/4ma1/exam-questions/probability

1. **3 marks**

A spinner can land on red, blue, green or yellow. $P(\text{red}) = 0.35$ and $P(\text{blue}) = 0.2$. The probability of green is twice the probability of yellow.

Work out the probability of green.

2. **2 marks**

(a) The probability of winning a game is 0.15. Leo plays 80 times. Work out an estimate for the number of times he wins. **(1)**

(b) A dice is thrown 120 times and lands on six 27 times. Write down the relative frequency of a six. **(1)**

3. **2 marks**

Two fair six-sided dice are thrown and the scores are added.

Work out the probability that the total is 8.

4. **2 marks**

A bag holds 5 red counters and 3 blue counters. A counter is taken at random and put back. A second counter is then taken at random.

Work out the probability that both counters are red.

5. **3 marks**

A bag holds 5 red counters and 3 blue counters. Two counters are taken at random without replacement.

Work out the probability that the two counters are the same colour.

6. **3 marks**

A fair dice is thrown three times.

Work out the probability of getting at least one six.

7. **2 marks**

(a) Events A and B are mutually exclusive. $P(A) = 0.3$ and $P(B) = 0.45$. Find $P(A \text{ or } B)$. **(1)**

(b) Events C and D are independent. $P(C) = 0.4$ and $P(D) = 0.7$. Find $P(C \text{ and } D)$. **(1)**

8. **3 marks**

A bag holds red, blue and green counters in the ratio $2 : 3 : 5$. There are 6 more blue counters than red counters.

(a) A counter is taken at random. Write down the probability that it is blue. **(1)**

(b) Work out the total number of counters in the bag. **(2)**

9. **2 marks**

A spinner numbered 1 to 4 and a spinner numbered 1 to 3 are both fair. Each is spun once and the two scores are multiplied.

Work out the probability that the product is even.

10. **4 marks**

A bag holds n red counters and 4 blue counters. Two counters are taken at random without replacement. The probability that both counters are red is $\frac{1}{3}$.

Work out the value of n.

Answers and worked solutions

Question 1 — 3 marks

M1 $1 - 0.35 - 0.2 = 0.45$

M1 $3y = 0.45$

A1 0.3

Answer: 0.3

Question 2 — 2 marks

(a)

B1 12

(b)

B1 $\dfrac{27}{120} = 0.225$

Answer: (a) 12; (b) 0.225

Question 3 — 2 marks

M1 5 ways out of 36: (2,6), (3,5), (4,4), (5,3), (6,2)

A1 $\dfrac{5}{36}$

Answer: $\dfrac{5}{36}$

Question 4 — 2 marks

M1 $\dfrac{5}{8} \times \dfrac{5}{8}$

A1 $\dfrac{25}{64}$

Answer: $\dfrac{25}{64}$

Question 5 — 3 marks

M1 $\dfrac{5}{8} \times \dfrac{4}{7}$ or $\dfrac{3}{8} \times \dfrac{2}{7}$

M1 $\dfrac{20}{56} + \dfrac{6}{56}$

A1 $\dfrac{13}{28}$

Answer: $\dfrac{13}{28}$

Question 6 — 3 marks

M1 $\left(\dfrac{5}{6}\right)^3 = \dfrac{125}{216}$

M1 $1 - \dfrac{125}{216}$

A1 $\dfrac{91}{216}$

Answer: $\dfrac{91}{216}$

Question 7 — 2 marks

(a)

B1 0.75

(b)

B1 0.28

Answer: (a) 0.75; (b) 0.28

Question 8 — 3 marks

(a)

B1 $\dfrac{3}{10}$

(b)

M1 $3k - 2k = 6$

A1 60

Answer: (a) $\dfrac{3}{10}$; (b) 60

Question 9 — 2 marks

M1 12 equally likely outcomes, of which 4 are odd (both scores odd)

A1 $\dfrac{8}{12} = \dfrac{2}{3}$

Answer: $\dfrac{2}{3}$

Question 10 — 4 marks

M1 $\dfrac{n}{n+4} \times \dfrac{n-1}{n+3} = \dfrac{1}{3}$

M1 $3n^2 - 3n = n^2 + 7n + 12$

M1 $n^2 - 5n - 6 = 0$, $(n-6)(n+1) = 0$

A1 $n = 6$

Answer: $n = 6$

Online, with every solution: igcsemathrevision.com/igcse-frontend/4ma1/exam-questions/probability
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