FOUNDATION & HIGHER

SAME AT BOTH TIERS

Name ..... Class .....

P7: Sample spaces

Possibility spaces for single and combined events; theoretical probability

20 marks · 25 minutes · Non-calculator

1) Two fair dice are rolled and the scores are added.

(a) Complete the sample space diagram.

+	1	2	3	4	5	6
1	2	3	4	5	6	7
2	3	4	5	6	7	8
3	4	5				
4	5					
5	6					
6	7					12

(b) Find $P(\text{total} = 7)$.

.....

(1)

(c) Find $P(\text{total} \geqslant 10)$.

.....

(1)

(d) Find P(both dice show the same number).

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(1)

[Question 1: 5 marks]

2) A fair coin is flipped and a fair dice is rolled. Find the probability of a head and an even number.

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[Question 2: 2 marks]

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3) A fair four-sided spinner (1 to 4) is spun and a fair dice is rolled. The two scores are multiplied. Find the probability that the product is 12.

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[Question 3: 2 marks]

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4) A letter is chosen at random from M, A, T, H, S. Find the probability that it is a vowel.

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[Question 4: 1 marks]

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5) Two fair coins are flipped. Find the probability of at least one head.

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[Question 5: 2 marks]

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6) Spinner A has 1, 2, 3 and spinner B has 2, 4. Both are fair. Their scores are added. Find the probability that the total is 5.

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[Question 6: 2 marks]

7) A card is chosen at random from cards numbered 1 to 20. Find the probability that it is a prime number.

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[Question 7: 2 marks]

8) A fair dice is rolled. Find the probability that the score is a factor of 6.

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[Question 8: 1 marks]

9) Two fair dice are rolled. Find the probability that both scores are odd.

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[Question 9: 2 marks]

10) A fair dice is rolled. Find the probability of not rolling a 6.

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[Question 10: 1 marks]

End of paper – 20 marks in total

Answers and brief mark scheme

Q	Answer	Method / notes
1	(a) completed grid (b) $\frac{1}{6}$ (c) $\frac{1}{6}$ (d) $\frac{1}{6}$	(a) B2 (B1 for one row wrong). (b)–(d) B1 each.
2	$\frac{1}{4}$	$\frac{3}{12}$ (M1); A1.
3	$\frac{1}{8}$	(2,6), (3,4), (4,3) out of 24 (M1); A1.
4	$\frac{1}{5}$	B1.
5	$\frac{3}{4}$	HH, HT, TH out of 4 (M1); A1.
6	$\frac{1}{3}$	(1,4) and (3,2) out of 6 (M1); A1.
7	$\frac{2}{5}$	8 primes (M1); $\frac{8}{20}$ (A1).
8	$\frac{2}{3}$	B1.
9	$\frac{1}{4}$	$\frac{9}{36}$ (M1); A1.
10	$\frac{5}{6}$	B1.