FOUNDATION & HIGHER

SAME AT BOTH TIERS

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

P3: Probability scale

Relative frequency and theoretical probability; the 0 to 1 probability scale

20 marks · 25 minutes · Non-calculator

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1) Choose a word from: impossible, unlikely, evens, likely, certain.

(a) Rolling a 7 on an ordinary dice

.....

(1)

(b) A fair coin landing on heads

.....

(1)

(c) Picking a red ball from a bag of 9 red balls and 1 blue ball

.....

(1)

[Question 1: 3 marks]

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2) Mark with a cross the probability of rolling a 4 on a fair dice.



[Question 2: 1 marks]

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3) A spinner has 4 equal sections, one of them red. It is spun 200 times and lands on red 46 times.

(a) Find the relative frequency of red.

.....

(1)

(b) Write down the theoretical probability of red.

.....

(1)

(c) Comment on your two answers.

.....

(1)

[Question 3: 3 marks]

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4) A dice is rolled 300 times. It lands on 4 a total of 71 times. Does this suggest the dice is biased? Give a reason.

.....

[Question 4: 1 marks]

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5) A fair dice is rolled. Write as a fraction the probability of rolling

(a) a prime number

.....

(1)

(b) a multiple of 3

.....

(1)

[Question 5: 2 marks]

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6) The table shows the relative frequency of an event after different numbers of trials.

Trials	10	50	100	500
Relative frequency	0.4	0.32	0.29	0.302

(a) Which value is the best estimate of the probability?

.....

(1)

(b) Suggest the theoretical probability of the event.

.....

(1)

[Question 6: 2 marks]

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7) A letter is chosen at random from the word PROBABILITY.

(a) Find $P(B)$.

.....

(1)

(b) Find $P(\text{vowel})$.

.....

(1)

[Question 7: 2 marks]

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8) Which is more likely: an event with probability 0.65 or an event with probability $\frac{3}{5}$?

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[Question 8: 1 marks]

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9) Write these probabilities in order, least likely first: 0.3, $\frac{2}{5}$, 35%, $\frac{1}{4}$

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[Question 9: 2 marks]

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10) A bag holds 4 red and 6 blue beads.

(a) Find the probability of taking a red bead.

.....

(1)

(b) A bead is taken and replaced 50 times, giving 22 red beads. Find the relative frequency of red.

.....

(1)

[Question 10: 2 marks]

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11) What does a probability of 0 mean?

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[Question 11: 1 marks]

End of paper – 20 marks in total

Answers and brief mark scheme

Q	Answer	Method / notes
1	(a) impossible (b) evens (c) likely	B1 each.
2	Cross at $\frac{1}{6}$	B1 (one-sixth of the way along).
3	(a) 0.23 (b) 0.25 (c) They are close	B1 each.
4	Yes; expected about 50, 71 is a lot more	B1.
5	(a) $\frac{1}{2}$ (b) $\frac{1}{3}$	B1 each.
6	(a) 0.302 (b) 0.3	B1 each.
7	(a) $\frac{2}{11}$ (b) $\frac{4}{11}$	B1 each.
8	0.65	B1.
9	$\frac{1}{4}$, 0.3, 35%, $\frac{2}{5}$	Convert to the same form (M1); A1.
10	(a) $\frac{2}{5}$ (b) 0.44	B1 each.
11	It is impossible	B1.