# 5.6 Probability Basics and the Probability Scale: 1-hour Pack

Total Marks

EDEXCEL 1ST0 · Calculator allowed · about 60 minutes

Name: _____ Date: ____ / ____ / _____

**Answer ALL questions. Show all your working.**

**1** A bag contains 2 orange, 1 blue, 3 black and 4 white beads. Harvey takes one at random.

(a) What is the probability that it is not orange?

(b) What is the probability that it is orange or blue?

(c) Harvey puts the object back and repeats this 40 times. How many times would you expect a orange object to be taken?

Give probabilities as fractions in their simplest form.

**(Total for Question 1 is 6 marks)**


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**2** A spinner has 4 colours. The probability of each colour is in the table. The colours are mutually exclusive.

| Colour | Probability |
|---|---|
| black | 3/20 |
| red | 1/20 |
| white | 1/20 |
| green | x |

(a) Work out the value of x.

(b) Work out the probability of red or white.

(c) The spinner is spun 50 times. Estimate the number of times it lands on green.

**(Total for Question 2 is 5 marks)**


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**3** A biased spinner has outcomes E, C, A, B, F. The probabilities are in the table; one value is missing.

| Outcome | Probability |
|---|---|
| E | 3/100 |
| C | 1/25 |
| A | 1/100 |
| B | 3/100 |
| F | x |

(a) Work out the value of x.

(b) The spinner is spun 1000 times. Estimate how many times outcome F occurs.

**(Total for Question 3 is 4 marks)**

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**4** A dice is rolled 60 times and a 4 is obtained 21 times. Sam says the dice is fair.

(a) Work out the relative frequency of a 4, as a decimal to 2 decimal places.

(b) How many 4s would be expected if the dice were fair?

(c) Does the experiment suggest the dice is biased? Give a reason.

**(Total for Question 4 is 3 marks)**


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**5** A bag contains 1 orange, 1 yellow and 6 red sweets. Zara takes one at random.

(a) What is the probability that it is not orange?

(b) What is the probability that it is orange or yellow?

(c) Zara puts the object back and repeats this 40 times. How many times would you expect a orange object to be taken?

Give probabilities as fractions in their simplest form.

**(Total for Question 5 is 6 marks)**

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**6** The probability that a seed germinates is 3/5. Out of 400 trials, how many times would you expect the event to happen?

**(Total for Question 6 is 2 marks)**


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**7** A spinner has 4 colours. The probability of each colour is in the table. The colours are mutually exclusive.

| Colour | Probability |
|---|---|
| yellow | 1/40 |
| green | 9/40 |
| white | 3/20 |
| blue | x |

(a) Work out the value of x.

(b) Work out the probability of blue or yellow.

(c) The spinner is spun 200 times. Estimate the number of times it lands on blue.

**(Total for Question 7 is 5 marks)**

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**8** In an experiment, a drawing pin landing point up happened 45 times in 50 trials.

(a) Write down the relative frequency of the event as a fraction in its simplest form.

(b) Write the relative frequency as a decimal, to 2 decimal places if necessary.

(c) Estimate the number of times the event will happen in 250 trials.

**(Total for Question 8 is 4 marks)**


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**9** A spinner has 4 colours. The probability of each colour is in the table. The colours are mutually exclusive.

| Colour | Probability |
|---|---|
| green | 1/5 |
| blue | 1/20 |
| yellow | 3/10 |
| black | x |

(a) Work out the value of x.
(b) Work out the probability of black or blue.
(c) The spinner is spun 50 times. Estimate the number of times it lands on black.

**(Total for Question 9 is 5 marks)**

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**10** For each event, write the probability as a number between 0 and 1 (as a fraction or decimal) and the word that best describes it: impossible, unlikely, evens, likely or certain.
(a) rolling a number less than 7 on an ordinary dice
(b) picking a prime from the whole numbers 1 to 6
(c) rolling an even number on an ordinary dice

**(Total for Question 10 is 2 marks)**


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**11** In an experiment, a drawing pin landing point up happened 44 times in 50 trials.

(a) Write down the relative frequency of the event as a fraction in its simplest form.

(b) Write the relative frequency as a decimal, to 2 decimal places if necessary.

(c) Estimate the number of times the event will happen in 250 trials.

**(Total for Question 11 is 4 marks)**

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**12** A spinner has 5 colours. The probability of each colour is in the table. The colours are mutually exclusive.

| Colour | Probability |
|---|---|
| red | 1/20 |
| blue | 1/5 |
| yellow | 3/40 |
| green | 1/5 |
| black | x |

(a) Work out the value of x.

(b) Work out the probability of black or red.

(c) The spinner is spun 50 times. Estimate the number of times it lands on black.

**(Total for Question 12 is 5 marks)**


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**13** For each event, write the probability as a number between 0 and 1 (as a fraction or decimal) and the word that best describes it: impossible, unlikely, evens, likely or certain.

(a) rolling a 7 on an ordinary dice

(b) picking a red ball from a bag with 9 red balls out of 10

(c) it will be a Tuesday tomorrow if today is Monday

**(Total for Question 13 is 3 marks)**

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**14** In an experiment, a drawing pin landing point up happened 51 times in 100 trials.

(a) Write down the relative frequency of the event as a fraction in its simplest form.

(b) Write the relative frequency as a decimal, to 2 decimal places if necessary.

(c) Estimate the number of times the event will happen in 500 trials.

**(Total for Question 14 is 4 marks)**

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**15** A fair 10-sided dice, numbered 1 to 10, is rolled once. Work out the probability of rolling a multiple of 3.

**(Total for Question 15 is 2 marks)**


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# Mark scheme · 5.6 Probability Basics and the Probability Scale: 1-hour Pack

## Question 1

| | |
|---|---|
| 1 - 1/5 or 8/10 | M1 |
| 4/5 oe | A1 |
| (2 + 1) / 10 | M1 |
| 3/10 oe | A1 |
| 1/5 x 40 | M1 |
| 8 cao | A1 |

**Answer: (a) 4/5; (b) 3/10; (c) 8**

## Question 2

| | |
|---|---|
| 1 minus the sum of the other probabilities | M1 |
| 3/4 oe | A1 |
| adds the two probabilities | M1 |
| 1/10 oe | A1 |
| 37.5 cao | B1 |

**Answer: (a) 3/4; (b) 1/10; (c) 37.5**

## Question 3

| | |
|---|---|
| 1 minus the sum of the other probabilities | M1 |
| 89/100 oe | A1 |
| 89/100 x 1000 | M1 |
| 890 cao | A1 |

**Answer: (a) 89/100; (b) 890**

## Question 4

| | |
|---|---|
| 0.35 | B1 |
| 10 | B1 |
| compares the observed and expected numbers: a large difference, so possibly biased | B1 |

**Answer: (a) 0.35; (b) 10; (c) possibly biased**

## Question 5

| | |
|---|---|
| 1 - 1/8 or 7/8 | M1 |
| 7/8 oe | A1 |
| (1 + 1) / 8 | M1 |
| 1/4 oe | A1 |
| 1/8 x 40 | M1 |
| 5 cao | A1 |

**Answer: (a) 7/8; (b) 1/4; (c) 5**

## Question 6

| | |
|---|---|
| 3/5 x 400 | M1 |
| 240 cao | A1 |

**Answer: 240**

## Question 7

| | |
|---|---|
| 1 minus the sum of the other probabilities | M1 |
| 3/5 oe | A1 |
| adds the two probabilities | M1 |
| 5/8 oe | A1 |
| 120 cao | B1 |

**Answer: (a) 3/5; (b) 5/8; (c) 120**

## Question 8

| | |
|---|---|
| 9/10 oe | B1 |
| 0.9 | B1 |
| 250 x 9/10 | M1 |
| 225 cao | A1 |

**Answer: (a) 9/10; (b) 0.9; (c) 225**

## Question 9

| | |
|---|---|
| 1 minus the sum of the other probabilities | M1 |
| 9/20 oe | A1 |
| adds the two probabilities | M1 |
| 1/2 oe | A1 |
| 22.5 cao | B1 |

**Answer: (a) 9/20; (b) 1/2; (c) 22.5**

## Question 10

| | |
|---|---|
| 1 and certain | B1 |
| 0.5 and evens | B1 |

**Answer: (a) 1, certain; (b) 0.5, evens; (c) 0.5, evens**

## Question 11

| | |
|---|---|
| 22/25 oe | B1 |
| 0.88 | B1 |
| 250 x 22/25 | M1 |
| 220 cao | A1 |

**Answer: (a) 22/25; (b) 0.88; (c) 220**

## Question 12

| | |
|---|---|
| 1 minus the sum of the other probabilities | M1 |
| 19/40 oe | A1 |
| adds the two probabilities | M1 |
| 21/40 oe | A1 |
| 23.75 cao | B1 |

**Answer: (a) 19/40; (b) 21/40; (c) 23.75**

## Question 13

| | |
|---|---|
| 0 and impossible | B1 |
| 0.9 and likely | B1 |
| 1 and certain | B1 |

**Answer: (a) 0, impossible; (b) 0.9, likely; (c) 1, certain**

## Question 14

| | |
|---|---|
| 51/100 oe | B1 |
| 0.51 | B1 |
| 500 x 51/100 | M1 |
| 255 cao | A1 |

**Answer: (a) 51/100; (b) 0.51; (c) 255**

## Question 15

| | |
|---|---|
| identifies 3, 6 and 9 as the multiples of 3 (3 favourable outcomes) | M1 |
| 3/10 oe cao | A1 |

**Answer: 3/10**


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