5.9 Relative and Expected Frequency: 1-hour Pack

EDEXCEL 1ST0 · Calculator allowed · about 60 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 In an experiment, a bus arriving late happened 50 times in 80 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 400 trials.

(Total for Question 1 is 4 marks)

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2 In an experiment, a biased coin landing on heads happened 39 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 2 is 4 marks)

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3 A bag contains 3 yellow, 1 blue and 1 orange marbles. Ravi takes one at random.

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

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

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

Give probabilities as fractions in their simplest form.

(Total for Question 3 is 6 marks)

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4 In an experiment, a seed germinating happened 10 times in 40 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 200 trials.

(Total for Question 4 is 4 marks)

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5 In an experiment, a drawing pin landing point up happened 5 times in 20 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 100 trials.

(Total for Question 5 is 4 marks)

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6 A bag contains 9 green, 3 yellow, 6 pink and 7 blue cubes. Uma takes one at random.

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

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

(c) Uma puts the object back and repeats this 100 times. How many times would you expect a green object to be taken?

Give probabilities as fractions in their simplest form.

(Total for Question 6 is 6 marks)

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7 In an experiment, a seed germinating happened 26 times in 80 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 400 trials.

(Total for Question 7 is 4 marks)

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8 A dice is rolled 120 times and a 4 is obtained 15 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 8 is 3 marks)

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9 A bag contains 8 red, 8 pink and 7 black sweets. Isla takes one at random.

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

(b) What is the probability that it is red or pink?

(c) Isla puts the object back and repeats this 230 times. How many times would you expect a red object to be taken?

Give probabilities as fractions in their simplest form.

(Total for Question 9 is 6 marks)

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10 The probability that a train is late is 2/5. Out of 200 trials, how many times would you expect the event to happen?

(Total for Question 10 is 2 marks)

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11 A dice is rolled 60 times and a 5 is obtained 2 times. Sam says the dice is fair.

(a) Work out the relative frequency of a 5, as a decimal to 2 decimal places.

(b) How many 5s would be expected if the dice were fair?

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

(Total for Question 11 is 3 marks)

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12 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) picking a vowel from the letters of the word BRIGHT

(b) a fair coin landing on heads

(c) rolling an even number on an ordinary dice

(Total for Question 12 is 2 marks)

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13 In an experiment, a bus arriving late happened 187 times in 200 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 1000 trials.

(Total for Question 13 is 4 marks)

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14 A dice is rolled 60 times and a 3 is obtained 21 times. Sam says the dice is fair.

(a) Work out the relative frequency of a 3, as a decimal to 2 decimal places.

(b) How many 3s would be expected if the dice were fair?

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

(Total for Question 14 is 3 marks)

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

(b) rolling an even number on an ordinary dice

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

(Total for Question 15 is 3 marks)

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Mark scheme · 5.9 Relative and Expected Frequency: 1-hour Pack

Question 1

5/8 oe	**B1**
0.63	**B1**
400 x 5/8	**M1**
250 cao	**A1**

Answer: (a) 5/8; (b) 0.63; (c) 250

Question 2

39/100 oe	**B1**
0.39	**B1**
500 x 39/100	**M1**
195 cao	**A1**

Answer: (a) 39/100; (b) 0.39; (c) 195

Question 3

1 - 3/5 or 2/5	**M1**
2/5 oe	**A1**
(3 + 1) / 5	**M1**
4/5 oe	**A1**
3/5 x 40	**M1**
24 cao	**A1**

Answer: (a) 2/5; (b) 4/5; (c) 24

Question 4

1/4 oe	**B1**
0.25	**B1**
200 x 1/4	**M1**
50 cao	**A1**

Answer: (a) 1/4; (b) 0.25; (c) 50

Question 5

1/4 oe	**B1**
0.25	**B1**
100 x 1/4	**M1**
25 cao	**A1**

Answer: (a) 1/4; (b) 0.25; (c) 25

Question 6

1 - 9/25 or 16/25	**M1**
16/25 oe	**A1**
(9 + 3) / 25	**M1**
12/25 oe	**A1**
9/25 x 100	**M1**
36 cao	**A1**

Answer: (a) 16/25; (b) 12/25; (c) 36

Question 7

13/40 oe	**B1**
0.33	**B1**
400 x 13/40	**M1**
130 cao	**A1**

Answer: (a) 13/40; (b) 0.33; (c) 130

Question 8

0.13	**B1**
20	**B1**
compares the observed and expected numbers: close to the expected value, so no clear evidence of bias	**B1**

Answer: (a) 0.13; (b) 20; (c) no clear evidence of bias

Question 9

1 - 8/23 or 15/23	**M1**
15/23 oe	**A1**
(8 + 8) / 23	**M1**
16/23 oe	**A1**
8/23 x 230	**M1**
80 cao	**A1**

Answer: (a) 15/23; (b) 16/23; (c) 80

Question 10

2/5 x 200	**M1**
80 cao	**A1**

Answer: 80

Question 11

0.03	**B1**
10	**B1**
compares the observed and expected numbers: a large difference, so possibly biased	**B1**

Answer: (a) 0.03; (b) 10; (c) possibly biased

Question 12

1/6 (awrt 0.17) and unlikely	**B1**
0.5 and evens	**B1**

Answer: (a) 1/6, unlikely; (b) 0.5, evens; (c) 0.5, evens

Question 13

187/200 oe	**B1**
0.94	**B1**
1000 x 187/200	**M1**
935 cao	**A1**

Answer: (a) 187/200; (b) 0.94; (c) 935

Question 14

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 15

0.9 and likely	**B1**
0.5 and evens	**B1**
1 and certain	**B1**

Answer: (a) 0.9, likely; (b) 0.5, evens; (c) 1, certain

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