5.8 Sample Space Diagrams: 1-hour Pack

EDEXCEL 1ST0 · Calculator allowed · about 60 minutes

Total Marks

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Two fair dice are rolled and the smaller score is subtracted from the larger score (the difference).

(a) Complete the number of outcomes with a difference of 2.

(b) Hence write down the probability that the difference is 2, in its simplest form.

(Total for Question 1 is 3 marks)

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2 A fair spinner has the numbers 1 to 5 on equal sections. It is spun and a fair coin is flipped.

(a) List the number of outcomes in the sample space.

(b) Work out the probability of getting a tail and a number greater than 1. Give your answer as a fraction in its simplest form.

(Total for Question 2 is 3 marks)

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3 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) a fair coin landing on heads

(b) rolling a number less than 7 on an ordinary dice

(c) rolling an even number on an ordinary dice

(Total for Question 3 is 3 marks)

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4 Two fair dice are rolled and the smaller score is subtracted from the larger score (the difference).

(a) Complete the number of outcomes with a difference of 1.

(b) Hence write down the probability that the difference is 1, in its simplest form.

(Total for Question 4 is 3 marks)

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5 A fair spinner has the numbers 1 to 4 on equal sections. It is spun and a fair coin is flipped.

(a) List the number of outcomes in the sample space.

(b) Work out the probability of getting a tail and a number greater than 1. Give your answer as a fraction in its simplest form.

(Total for Question 5 is 3 marks)

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6 A bag contains 8 orange, 4 green and 3 blue sweets. Wendy takes one at random.

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

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

(c) Wendy puts the object back and repeats this 60 times. How many times would you expect a orange object to be taken?

Give probabilities as fractions in their simplest form.

(Total for Question 6 is 6 marks)

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7 Two fair 8-sided dice, numbered 1 to 8, are rolled and the scores are added.

(a) How many outcomes are in the sample space?

(b) Work out the probability that the total score is 8. Give the probability as a fraction in its simplest form.

(Total for Question 7 is 3 marks)

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8 Spinner A has the numbers 1 to 5 and spinner B has the numbers 1 to 3, each on equal sections. Both are spun and the two numbers are multiplied.

(a) How many outcomes are there?

(b) Work out the probability that the product is even and at least 7. Give your answer as a fraction in its simplest form.

(Total for Question 8 is 3 marks)

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9 A bag contains 3 white, 6 blue and 3 orange sweets. Aisha takes one at random.

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

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

(c) Aisha puts the object back and repeats this 60 times. How many times would you expect a white object to be taken?

Give probabilities as fractions in their simplest form.

(Total for Question 9 is 6 marks)

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10 A fair spinner has the numbers 1 to 3 on equal sections. It is spun and a fair coin is flipped.

(a) List the number of outcomes in the sample space.

(b) Work out the probability of getting an odd number and a head. Give your answer as a fraction in its simplest form.

(Total for Question 10 is 3 marks)

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11 Spinner A has the numbers 1 to 5 and spinner B has the numbers 1 to 4, each on equal sections. Both are spun and the two numbers are multiplied.

(a) How many outcomes are there?

(b) Work out the probability that the product is even and at least 5. Give your answer as a fraction in its simplest form.

(Total for Question 11 is 3 marks)

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

Outcome	Probability
B	1/40
C	1/20
E	1/40
A	1/10
D	1/5
F	x

(a) Work out the value of x.

(b) The spinner is spun 200 times. Estimate how many times outcome F occurs.

(Total for Question 12 is 4 marks)

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13 Two fair dice are rolled and the smaller score is subtracted from the larger score (the difference).

(a) Complete the number of outcomes with a difference of 0.

(b) Hence write down the probability that the difference is 0, in its simplest form.

(Total for Question 13 is 3 marks)

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14 Spinner A has the numbers 1 to 3 and spinner B has the numbers 1 to 5, each on equal sections. Both are spun and the two numbers are multiplied.

(a) How many outcomes are there?

(b) Work out the probability that the product is even and at least 4. Give your answer as a fraction in its simplest form.

(Total for Question 14 is 3 marks)

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15 A bag contains 5 black, 6 orange, 8 blue and 4 pink marbles. Callum takes one at random.

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

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

(c) Callum puts the object back and repeats this 460 times. How many times would you expect a black object to be taken?

Give probabilities as fractions in their simplest form.

(Total for Question 15 is 6 marks)

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16 Spinner A has the numbers 1 to 5 and spinner B has the numbers 1 to 3, each on equal sections. Both are spun and the two numbers are multiplied.

(a) How many outcomes are there?

(b) Work out the probability that the product is even and at least 3. Give your answer as a fraction in its simplest form.

(Total for Question 16 is 3 marks)

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Mark scheme · 5.8 Sample Space Diagrams: 1-hour Pack

Question 1

systematic listing of the 36 outcomes	**M1**
8 outcomes	**A1**
2/9 oe	**B1**

Answer: (a) 8; (b) 2/9

Question 2

10	**B1**
4 favourable outcomes out of 10	**M1**
2/5 oe	**A1**

Answer: (a) 10; (b) 2/5

Question 3

0.5 and evens	**B1**
1 and certain	**B1**
0.5 and evens	**B1**

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

Question 4

systematic listing of the 36 outcomes	**M1**
10 outcomes	**A1**
5/18 oe	**B1**

Answer: (a) 10; (b) 5/18

Question 5

8	**B1**
3 favourable outcomes out of 8	**M1**
3/8 oe	**A1**

Answer: (a) 8; (b) 3/8

Question 6

1 - 8/15 or 7/15	**M1**
7/15 oe	**A1**
(8 + 4) / 15	**M1**
4/5 oe	**A1**
8/15 x 60	**M1**
32 cao	**A1**

Answer: (a) 7/15; (b) 4/5; (c) 32

Question 7

64	**B1**
7 out of 64 outcomes counted	**M1**
7/64 oe	**A1**

Answer: (a) 64; (b) 7/64

Question 8

15	**B1**
3 favourable outcomes out of 15	**M1**
1/5 oe	**A1**

Answer: (a) 15; (b) 1/5

Question 9

1 - 1/4 or 9/12	**M1**
3/4 oe	**A1**
(3 + 6) / 12	**M1**
3/4 oe	**A1**
1/4 x 60	**M1**
15 cao	**A1**

Answer: (a) 3/4; (b) 3/4; (c) 15

Question 10

6	**B1**
2 favourable outcomes out of 6	**M1**
1/3 oe	**A1**

Answer: (a) 6; (b) 1/3

Question 11

20	**B1**
9 favourable outcomes out of 20	**M1**
9/20 oe	**A1**

Answer: (a) 20; (b) 9/20

Question 12

1 minus the sum of the other probabilities	**M1**
3/5 oe	**A1**
3/5 x 200	**M1**
120 cao	**A1**

Answer: (a) 3/5; (b) 120

Question 13

systematic listing of the 36 outcomes	**M1**
6 outcomes	**A1**
1/6 oe	**B1**

Answer: (a) 6; (b) 1/6

Question 14

15	**B1**
7 favourable outcomes out of 15	**M1**
7/15 oe	**A1**

Answer: (a) 15; (b) 7/15

Question 15

1 - 5/23 or 18/23	**M1**
18/23 oe	**A1**
(5 + 6) / 23	**M1**
11/23 oe	**A1**
5/23 x 460	**M1**
100 cao	**A1**

Answer: (a) 18/23; (b) 11/23; (c) 100

Question 16

15	**B1**
7 favourable outcomes out of 15	**M1**
7/15 oe	**A1**

Answer: (a) 15; (b) 7/15

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