5.3 Listing Outcomes and Sample Space Diagrams: Test Pack

Calculators not allowed · about 55 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 Write down the possible outcomes for each single event.

(a) A fair coin is flipped once. Write down the possible outcomes. **(1)**

.....

(b) A 4-sided spinner numbered 1 to 4 is spun once. Write down the possible outcomes. **(1)**

.....

(c) A die with faces 1 to 6 is rolled and the outcome recorded. Write down the possible outcomes for the number shown. **(1)**

.....

(d) A bag contains one red and one blue counter. One counter is drawn at random. Write down the possible outcomes for the colour drawn. **(1)**

.....

2 Three fair coins are flipped. List the sample space and find the probability of getting exactly two heads.

(2)

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3 Stretch. Two fair six-sided dice are rolled. Find the probability that both dice show even numbers.

(3)

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4 A cafe sells 5 different sandwiches and 4 different drinks. A meal deal is one sandwich and one drink. How many different meal deals are possible?

(2)

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5 A cafe sells 4 different sandwiches and 3 different drinks. A meal deal is one sandwich and one drink. How many different meal deals are possible?

(2)

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6 A school lunch has 3 starters, 2 mains and 3 desserts. A pupil chooses one of each. How many different lunches are possible?

(2)

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7 20 cards are numbered 1 to 20. One card is chosen at random. Work out the probability that the number on the card is a factor of 20. Give your answer as a fraction in its simplest form.

(2)

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8 A fair six-sided die is rolled and a fair spinner numbered 1 to 5 is spun. The two scores are multiplied. Work out the probability that the product is even.

(3)

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9 Spinner A has the numbers 1 to 5 and spinner B has the numbers 1 to 4. Each spinner is fair. Both are spun and the two scores are multiplied. Work out the probability that the product is exactly 2.

(3)

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10 24 cards are numbered 1 to 24. One card is chosen at random. Work out the probability that the number on the card is less than 8. Give your answer as a fraction in its simplest form.

(2)

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11 A school lunch has 4 starters, 2 mains and 3 desserts. A pupil chooses one of each. How many different lunches are possible?

(2)

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12 Two fair six-sided dice are rolled and the scores are added. Work out the probability that the total is 4.

(3)

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13 A bag contains two counters labelled P and Q only, one of each. A counter is picked at random, replaced, then a second counter is picked. List the sample space of ordered pairs.

(2)

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14 A box contains three cards labelled 1, 2 and 3. A card is picked at random, replaced, then a second card is picked.

(a) List the sample space of ordered pairs. **(1)**

(b) Find the probability that the two cards picked show different numbers. **(1)**

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15 A bag contains 4 counters labelled 1, 2, 3, 4. A counter is drawn at random, replaced, then a second counter is drawn. Find the probability that the sum of the two numbers drawn is greater than 6.

(3)

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16 A spinner has 3 equal sections coloured red, white and blue. It is spun twice. Find the probability that at least one spin lands on red.

(3)

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17 A fair coin is tossed once. How many possible outcomes are there?

(1)

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18 A four-sided spinner has equal sections labelled W, X, Y, Z. The spinner is spun once, then a coin is tossed once. List the sample space of (spinner result, coin result) pairs.

(2)

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Mark scheme · 5.3 Listing Outcomes and Sample Space Diagrams: Test Pack

A correct answer earns full marks unless the question asks for working, a method, proof or explanation.

Question 1

(a) H and T listed (order not important) cao	B1
(a) Answer: **H, T**	
(b) 1, 2, 3, 4 all listed cao	B1
(b) Answer: **1, 2, 3, 4**	
(c) 1, 2, 3, 4, 5, 6 all listed cao	B1
(c) Answer: **1, 2, 3, 4, 5, 6**	
(d) red and blue listed cao	B1
(d) Answer: **red, blue**	

Question 2

list or recognise sample space has 8 outcomes and count favourable ones (3 outcomes: HHT, HTH, THH)	M1
probability 3/8 cao	A1
Answer: **Sample space: HHH, HHT, HTH, HTT, THH, THT, TTH, TTT; probability 3/8**	

Question 3

identify even faces on one die are 2,4,6 (3/6 = 1/2) and method of multiplying for two independent dice	M1
compute (1/2) x (1/2) = 1/4	M1
final probability 1/4 cao	A1
Answer: **1/4**	

Question 4

5 x 4	M1
20 cao	A1
Answer: **20**	

Question 5

4 x 3	M1
12 cao	A1
Answer: **12**	

Question 6

3 x 2 x 3	M1
18 cao	A1
Answer: **18**	

Question 7

6 favourable outcomes out of 20	M1
3/10 cao	A1
Answer: **3/10**	

Question 8

30 equally likely outcomes	M1
21 outcomes with an even product	M1
7/10 cao	A1
Answer: **7/10**	

Question 9

sample space or table with 20 outcomes	M1
2 favourable outcomes	M1
1/10 cao	A1
Answer: **1/10**	

Question 10

7 favourable outcomes out of 24	M1
7/24 cao	A1
Answer: **7/24**	

Question 11

4 x 2 x 3	M1
24 cao	A1
Answer: **24**	

Question 12

sample space or list of the 36 outcomes (or 36 seen)	M1
3 outcomes with total 4	M1
1/12 cao	A1
Answer: **1/12**	

Question 13

method pairing each first pick with each second pick, with replacement	M1
complete list of 4: (P,P), (P,Q), (Q,P), (Q,Q) cao	A1
Answer: **(P,P), (P,Q), (Q,P), (Q,Q)**	

Question 14

(a) all nine ordered pairs listed cao	B1
(a) Answer: **(1,1),(1,2),(1,3),(2,1),(2,2),(2,3),(3,1),(3,2),(3,3)**	
(b) 2/3 cao oe (e.g. 6/9)	B1
(b) Answer: **2/3**	

Question 15

identify the sample space has 16 outcomes	M1
count the 3 favourable outcomes with sum greater than 6: (3,4), (4,3), (4,4)	M1
3/16 cao	A1
Answer: **3/16**	

Question 16

use the complement: P(not red on one spin) = 2/3	M1
compute P(not red on both spins) = 2/3 x 2/3 = 4/9	M1
5/9 cao	A1
Answer: **5/9**	

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Question 17

2 cao	**B1**

Answer: **2**

Question 18

method pairing each of the 4 letters with H and T	**M1**
complete list of 8: (W,H),(W,T),(X,H),(X,T),(Y,H),(Y,T),(Z,H),(Z,T) cao	**A1**

Answer: **(W,H), (W,T), (X,H), (X,T), (Y,H), (Y,T), (Z,H), (Z,T)**

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