Sample space diagrams

ANSWERS

1

A fair coin is flipped and a fair spinner numbered 1 to 4 is spun. Complete the grid. Ring the cells for tails and an even number. Find the probability.

	1	2	3	4
H	H1	H2	H3	H4
T	T1	(T2)	T3	(T4)

Cells that match: 2

Total cells: 8

Answer: $\frac{2}{8} = \frac{1}{4}$

2

A fair spinner numbered 1 to 2 and a fair spinner numbered 1 to 5 are spun.
The scores are added. Find the probability that the total is 4.

+	1	2	3	4	5
1	2	3	4	5	6
2	3	(4)	5	6	7

Cells that match: 2

Total cells: 10

Answer: $\frac{2}{10} = \frac{1}{5}$

3

A fair spinner numbered 1 to 3 is spun and a fair dice is rolled. The scores are added.
Find the probability that the total is 8.

+	1	2	3	4	5	6
1	2	3	4	5	6	7
2	3	4	5	6	7	(8)
3	4	5	6	7	(8)	9

Answer: $\frac{2}{18} = \frac{1}{9}$

4

A fair spinner numbered 1 to 5 and a fair spinner numbered 1 to 4 are spun.
The scores are added. Find the probability that the total is 7.

+	1	2	3	4
1	2	3	4	5
2	3	4	5	6
3	4	5	6	(7)
4	5	6	(7)	8
5	6	(7)	8	9

Answer: $\frac{3}{20}$

5

A fair spinner numbered 1 to 4 is spun and a fair dice is rolled. The scores are multiplied.
Find the probability that the score is 12.

×	1	2	3	4	5	6
1	1	2	3	4	5	6
2	2	4	6	8	10	(12)
3	3	6	9	(12)	15	18
4	4	8	(12)	16	20	24

Answer: $\frac{3}{24} = \frac{1}{8}$

6

A fair coin is flipped and one of these cards is picked at random. List every possible outcome, for example HA.
Find the probability of heads and B.

A	B	C

Outcomes: HA, HB, HC, TA, TB, TC

Answer: $\frac{1}{6}$

7

Two fair dice are rolled and the scores are added. Find the probability that the total is less than 4.

+	1	2	3	4	5	6
1	(2)	(3)	4	5	6	7
2	(3)	4	5	6	7	8
3	4	5	6	7	8	9
4	5	6	7	8	9	10
5	6	7	8	9	10	11
6	7	8	9	10	11	12

Answer: $\frac{3}{36} = \frac{1}{12}$

8

Two fair spinners, each numbered 1 to 3, are spun and the scores are added.
Ravi says the totals are 2, 3, 4, 5 and 6, so P(total of 4) = $\frac{1}{5}$. Explain his mistake.
Then find P(total of 4).

+	1	2	3
1	2	3	(4)
2	3	(4)	5
3	(4)	5	6

Mistake: the totals are not equally likely

Answer: $\frac{3}{9} = \frac{1}{3}$

Sample space diagrams *further practice*

ANSWERS

9

Two fair spinners, each numbered 1 to 5, are spun. The scores are added.
Find the probability that the total is 6.

+	1	2	3	4	5
1	2	3	4	5	(6)
2	3	4	5	(6)	7
3	4	5	(6)	7	8
4	5	(6)	7	8	9
5	(6)	7	8	9	10

Answer $\frac{5}{25} = \frac{1}{5}$

10

In a board game, you need to roll a double to start: two fair dice showing the same number. Find the probability of rolling a double.

6 doubles out of 36 outcomes

Answer $\frac{6}{36} = \frac{1}{6}$

11

A fair spinner has three equal sections: red, blue and green. It is spun and a fair dice is rolled. Find the probability of blue and a number greater than 2.

	1	2	3	4	5	6
R	R1	R2	R3	R4	R5	R6
B	B1	B2	(B3)	(B4)	(B5)	(B6)
G	G1	G2	G3	G4	G5	G6

B3, B4, B5, B6: 4 out of 18

Answer $\frac{4}{18} = \frac{2}{9}$

12

Two fair spinners, each numbered 1 to 4, are spun and the scores are added.
Which total is the most likely?
Write down its probability.

+	1	2	3	4
1	2	3	4	(5)
2	3	4	(5)	6
3	4	(5)	6	7
4	(5)	6	7	8

Total 5

Probability $\frac{4}{16} = \frac{1}{4}$

13

At a school fair, players roll two fair dice and add the scores. A total of 11 or more wins a prize. 72 people play once each.
How many would you expect to win a prize?

$\frac{3}{36} = \frac{1}{12}$, and $\frac{1}{12}$ of 72 = 6

Answer 6 people

14

A fair coin is flipped and a fair spinner with equal sections numbered 1, 2, 3 and so on is spun. There are 10 possible outcomes.
(a) How many sections does the spinner have? (b) Find the probability of heads and 5.

2 × 5 = 10

(a) 5 sections

(b) $\frac{1}{10}$

15

Nina has 3 hats (red, grey and black) and 4 scarves (blue, white, green and yellow). She picks one hat and one scarf at random. (a) How many different outfits are there? (b) Find the probability of the red hat with the blue scarf.

3 × 4 = 12

(a) 12 outfits

(b) $\frac{1}{12}$

16

A fair spinner numbered 1 to 3 and a fair spinner numbered 1 to 4 are spun.
The scores are added. Zara says an even total is more likely than an odd total.
Is she right? Show how you know.

+	1	2	3	4
1	2	3	4	5
2	3	4	5	6
3	4	5	6	7

even $\frac{6}{12}$, odd $\frac{6}{12}$: equally likely

Answer No