

GCSE Maths: Listing outcomes and sample-space tables

(Foundation): answers

GCSE Maths - Probability - Foundation - Lesson 23.4

Answers. Final answers to the worksheet questions. Full step-by-step solutions for every question are free at websink.site/gcse/maths/ch23-probability/foundation/listing-outcomes-and-sample-space-tables/

Exercise 23E Listing outcomes and sample-space tables Non-calculator

1 A fair coin is tossed and a fair die is rolled. Write the outcomes as, for example, H3 (heads and a 3). Find...

(a) the number of possible outcomes

Answer: 12

(b) the probability of heads and a 6

Answer: $\frac{1}{12}$

(c) the probability of tails and an odd number

Answer: $\frac{1}{4}$

2 Three fair coins are tossed. List all the possible outcomes systematically. Then find the probability of getting...

(a) exactly two heads

Answer: $\frac{3}{8}$

(b) at least one tail

Answer: $\frac{7}{8}$

(c) all three coins the same

Answer: $\frac{1}{4}$

3 Two fair dice are rolled and the scores are added. Use the sample-space table to find the probability that the total is...

+	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

(a) 7

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

(b) 12

Answer: $\frac{1}{36}$

(c) less than 5

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

(d) an even number

Answer: $\frac{1}{2}$

(e) a prime number

Answer: $\frac{5}{12}$

- 4 Two fair coins are tossed. Write down all the possible outcomes, using H for heads and T for tails. Then find the probability of two heads.

Answer: $\frac{1}{4}$

- 5 Two fair dice are rolled. The **difference** is the bigger score take away the smaller score (it is 0 if the scores are equal). Find the probability that the difference is...

(a) 0

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

(b) at least 4

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

(c) 1

Answer: $\frac{5}{18}$

- 6 Two fair dice are rolled and the scores are **multiplied**. Find the probability that the product is...

(a) 12

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

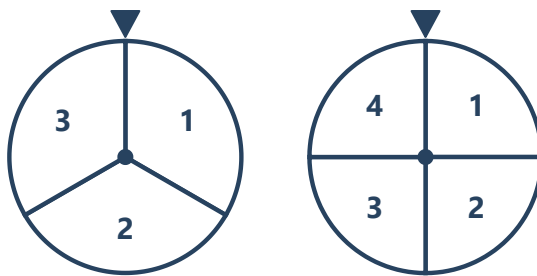
(b) an odd number

Answer: $\frac{1}{4}$

(c) more than 20

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

- 7 Spinner A has the numbers 1, 2, 3 and spinner B has the numbers 1, 2, 3, 4. Both are fair and are spun once. The two numbers are added. Draw a sample-space table and find the probability that the total is...



(a) 5

Answer: $\frac{1}{4}$

(b) more than 4

Answer: $\frac{1}{2}$

(c) an even number

Answer: $\frac{1}{2}$

8 A two-digit number is made by choosing the tens digit from 1, 2, 3 and the units digit from 1, 2, 3 (digits can be repeated). List all the possible numbers, then find the probability that a number chosen at random is...

(a) even

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

(b) bigger than 25

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

9 The letters A, B and C are put in a row in a random order, using each letter once. List all the possible orders. Find the probability that A is first.

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

10 A café offers 3 sandwiches (cheese, ham, egg), 2 soups (tomato, leek) and 4 drinks.

(a) How many different sandwich and soup combinations are there?

Answer: 6

(b) How many different meals of sandwich, soup and drink are there?

Answer: 24

(c) A customer picks a sandwich and a soup at random. Find the probability of ham and tomato.

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

11 A code has one letter chosen from A, B, C, followed by one digit chosen from 1, 2, 3, 4. A code is chosen at random. Find the probability that it is...

(a) A followed by an even digit

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

(b) B3 or C3

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

- 12** Ali and Beth play a game. Two fair dice are rolled and the scores are added. Ali wins if the total is 8 or more. Beth wins if the total is less than 8. Is the game fair? Show your working.

Answer: No: Ali 5/12, Beth 7/12

- 13** Two fair dice, one red and one blue, are rolled. Find the probability that the red die shows a bigger score than the blue die.

Answer: $\frac{5}{12}$

- 14** Tom says: "When I toss two coins there are three outcomes: two heads, one head, no heads. So $P(\text{two heads}) = 1/3$." Explain why Tom is wrong and give the correct probability.

Answer: 1/4

- 15** Two fair dice are rolled and the scores are added. Show that a total of 7 is more likely than any other total.

Answer: 7 occurs 6 times out of 36; no other total occurs more than 5 times

- 16** How many different outcomes are there when...

(a) two fair dice

Answer: 36

(b) three fair dice

Answer: 216