



1 Ola is choosing an outfit.

She has 3 shirts: red (R), blue (B) and green (G).

She has 2 pairs of shorts: black (K) and white (W).

List all the possible outfits Ola can choose. One outfit, RK, has been done for you.

(2 marks)

Pair each shirt with each pair of shorts in turn

Red: RK, RW. Blue: BK, BW. Green: GK, GW

There are 6 outfits in total

RK, RW, BK, BW, GK, GW

2 A cafe sells 3 hot drinks: tea (T), coffee (C) and hot chocolate (H).

It sells 2 cakes: flapjack (F) and brownie (B).

Noah chooses one hot drink and one cake.

List all the possible combinations Noah can choose.

(2 marks)

Pair each drink with each cake in turn

Tea: TF, TB. Coffee: CF, CB. Hot chocolate: HF, HB

There are 6 combinations in total

TF, TB, CF, CB, HF, HB

3 Bag A contains three cards numbered 1, 2 and 3.

Bag B contains two cards numbered 5 and 7.

Erin takes one card from bag A and one card from bag B.

Write down all the possible pairs of cards Erin can take.

(2 marks)

Pair each card from bag A with each card from bag B

1 with 5, 1 with 7, 2 with 5, 2 with 7, 3 with 5, 3 with 7

There are 6 possible pairs

4

Ali throws a fair coin 3 times.

Each throw lands on heads (H) or tails (T).

List all the possible outcomes of the 3 throws. One outcome, HHH, has been done for you.

(2 marks)

Work systematically, starting with outcomes beginning H
HHH, HHT, HTH, HTT, then THH, THT, TTH, TTT

There are 8 outcomes in total

HHH, HHT, HTH, HTT, THH, THT, TTH, TTT

5

A locker code is a letter followed by a prime number.

The letter is chosen from P, Q and R.

The prime number is chosen from 3 and 7.

List all the possible locker codes.

(2 marks)

Pair each letter with each prime in turn

P: P3, P7. Q: Q3, Q7. R: R3, R7

There are 6 possible codes

P3, P7, Q3, Q7, R3, R7

6

A pizza shop offers 4 toppings: mushroom (M), pepper (P), olive (O) and sweetcorn (S).

Jo chooses 2 different toppings for her pizza.

List all the possible pairs of toppings Jo can choose.

(2 marks)

Work systematically. The order of the two toppings does not matter

With M: MP, MO, MS. With P (not already listed): PO, PS.

With O: OS

There are 6 possible pairs

MP, MO, MS, PO, PS, OS

- 7 Spinner A has three equal sections numbered 1, 2 and 3.
 Spinner B has two equal sections numbered 4 and 5.
 Both spinners are spun and the two numbers are multiplied together.
 List all the possible products.

(2 marks)

Multiply each number on spinner A by each number on spinner B

$$1 \times 4 = 4, 1 \times 5 = 5, 2 \times 4 = 8, 2 \times 5 = 10, 3 \times 4 = 12, 3 \times 5 = 15$$

The possible products are 4, 5, 8, 10, 12 and 15

4, 5, 8, 10, 12, 15

- 8 Ivy has three coins: a 5p coin, a 10p coin and a 20p coin.
 She picks two different coins and adds their values.
 List all the possible totals.

(2 marks)

The possible pairs are 5p and 10p, 5p and 20p, 10p and 20p

The totals are 15p, 25p and 30p

15p, 25p, 30p

- 9 Spinner A has sections numbered 1, 2 and 3. Spinner B has sections numbered 1 and 2.
 Both spinners are spun and the two scores are added together. Part of the sample space table is shown.

Spinner B \ Spinner A	1	2	3
1	2	3	4
2			

- a. Complete the table.
 b. Write down the probability that the total score is 4.

(3 marks)

a)

Row B = 2: $2+1, 2+2, 2+3$

3, 4, 5

b)

6 outcomes altogether

A total of 4 appears 2 times

$$\frac{2}{6} = \frac{1}{3}$$

$\frac{1}{3}$

10

A fair coin is thrown and a fair four-sided spinner, numbered 1, 2, 3 and 4, is spun.

- List all the possible outcomes. One has been done for you: H1.
- Work out the probability of getting a head and an even number.

(3 marks)

a)

H: H1 H2 H3 H4

T: T1 T2 T3 T4

b)

8 outcomes in total

Head and even: H2, H4

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

$$\boxed{\frac{1}{4}}$$

11

Mia picks a card at random from cards numbered 1, 2 and 3.

Kofi picks a card at random from cards numbered 2 and 4.

Their two numbers are added together.

- Draw a sample space table to show all the possible totals.
- Work out the probability that the total is an odd number.

(4 marks)

a)

Totals (Kofi 2 and 4):

Mia 1: 3, 5

Mia 2: 4, 6

Mia 3: 5, 7

b)

6 outcomes, odd totals: 3, 5, 5, 7 = 4

$$\frac{4}{6} = \frac{2}{3}$$

$$\boxed{\frac{2}{3}}$$

12

Two fair six-sided dice are rolled and their scores are added together.

- Draw a sample space diagram to show all the possible total scores. How many outcomes are there?
- Work out the probability that the total is 7.
- Work out the probability that the total is at least 9.

(4 marks)

a)

6 rows x 6 columns of totals (2 to 12)

36 outcomes

b)

Total 7: 6 outcomes

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

$$\frac{1}{6}$$

c)

9 appears 4 times, 10 three times

11 twice, 12 once

$$4 + 3 + 2 + 1 = 10$$

$$\frac{10}{36} = \frac{5}{18}$$

$$\frac{5}{18}$$