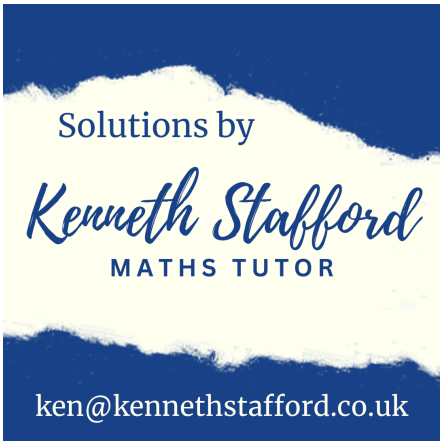
# Name: SOLUTIONS

GCSE (1 - 9)

# Probability and Relative Frequency




These questions are compiled from *released* Pearson Edexcel GCSE maths exam papers
They contain exam questions from up until the ***Summer 2023*** exam series
More recent exam papers do exist but are withheld for mock exams
As new exam papers are released these worksheets will gradually be updated
The ***most current*** version of these worksheets will always be available at: kennethstafford.co.uk

| Question | Where the question appeared |
|---|---|
| 1 | Edexcel, GCSE, Autumn 2021, Paper 3F, Q26 |
| 2 | Edexcel, GCSE, Autumn 2019, Paper 3F, Q16 |
| 3 | Edexcel, GCSE, Summer 2019, Paper 1F, Q22 |
| 4 | Edexcel, GCSE, Autumn 2018, Paper 3F, Q14 |
| 5 | Edexcel, GCSE, Summer 2018, Paper 3F, Q24 |
| 6 | Edexcel, GCSE, Autumn 2017, Paper 1F, Q17 |
| 7 | Edexcel, GCSE, Autumn 2017, Paper 3F, Q26 |
| 8 | Edexcel, GCSE, Summer 2017, Paper 2F, Q17 |
| 9 | Edexcel, GCSE, Summer 2022, Paper 1F, Q13 |
| | |
| | |

**1**

In a bag there are only red counters, blue counters, green counters and pink counters.
A counter is going to be taken at random from the bag.

The table shows the probabilities of taking a red counter or a blue counter.

| **Colour** | red | blue | green | pink |
|---|---|---|---|---|
| **Probability** | 0.05 | 0.15 | 0.5 | 0.3 |

The probability of taking a green counter is 0.2 more than the probability of taking a pink counter.

(a) Complete the table.

$0.05 + 0.15 = 0.2$

$1 - 0.2 = 0.8$

Pink = $x$

Green = $x + 0.2$

$x + x + 0.2 = 0.8$

$2x + 0.2 = 0.8$

$2x = 0.6$

$x = 0.3$

**(2)**

There are 18 blue counters in the bag.

(b) Work out the total number of counters in the bag.

$0.15 = 15\%$

$15\% = 18$

$\div 3$ ↓ $5\% = 6$ $\div 3$ ↓

$\times 20$ ↓ $100\% = 120$ $\times 20$ ↓

120

**(2)**

**(Total for Question 26 is 4 marks)**

*[Edexcel, GCSE, Autumn 2021, Paper 3F, Q26]*

**2**

In a bag there are only red counters, blue counters, green counters and yellow counters.
A counter is taken at random from the bag.

The table shows the probabilities of getting a red counter or a yellow counter.

| **Colour** | red | blue | green | yellow |
|---|---|---|---|---|
| **Probability** | 0.4 | 0.15 | 0.2 | 0.25 |

the number of blue counters : the number of green counters = 3 : 4

Complete the table.

$0.4 + 0.25 = 0.65$

$1 - 0.65 = 0.35$

0.35 shared in a 3:4 ratio

$3 + 4 = 7$ parts

7 parts = 0.35

1 part = 0.05

Blue = 3 parts = 0.15

Green = 4 parts = 0.20

**(Total for Question 16 is 4 marks)**

*[Edexcel, GCSE, Autumn 2019, Paper 3F, Q16]*

**3**

There are only blue cubes, red cubes and yellow cubes in a box.

The table shows the probability of taking at random a blue cube from the box.

| **Colour** | blue | red | yellow |
|---|---|---|---|
| **Probability** | 0.2 | 0.4<br>$x$ | 0.4<br>$x$ |

The number of red cubes in the box is the same as the number of yellow cubes in the box.

(a) Complete the table.

$1 - 0.2 = 0.8$

$x + x = 2x$

$2x = 0.8$

$x = 0.4$

**(2)**

There are 12 blue cubes in the box.

(b) Work out the total number of cubes in the box.

$0.2 = 20\%$

$20\% = 12$ (×5)

$100\% = 60$ (×5)

60

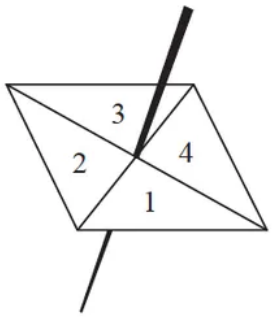
**(2)**

**(Total for Question 22 is 4 marks)**

*[Edexcel, GCSE, Summer 2019, Paper 1F, Q22]*

**4**

Here is a 4-sided spinner.




The table shows the probabilities that when the spinner is spun it will land on 1, on 3 and on 4

| **Number** | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| **Probability** | 0.2 | 0.3 | 0.4 | 0.1 |

The spinner is spun once.

(a) Work out the probability that the spinner will land on 2

$0.2 + 0.4 + 0.1 = 0.7$

$1 - 0.7 = 0.3$

0.3

(1)

(b) Which number is the spinner least likely to land on?

4

(1)

Jake is going to spin the spinner 60 times.

(c) Work out an estimate for the number of times the spinner will land on 1

$60 \times 0.2 = 12$

12

(2)

**(Total for Question 14 is 4 marks)**

*[Edexcel, GCSE, Autumn 2018, Paper 3F, Q14]*

**5**

There are some counters in a bag.
The counters are red or white or blue or yellow.

Bob is going to take at random a counter from the bag.

The table shows each of the probabilities that the counter will be blue or will be yellow.

| **Colour** | red | white | blue | yellow |
|---|---|---|---|---|
| **Probability** | 0·2 (2x) | 0·1 (x) | 0.45 | 0.25 |

$2x + x = 3x$

There are 18 blue counters in the bag.

The probability that the counter Bob takes will be red is twice the probability that the counter will be white.

(a) Work out the number of red counters in the bag.

$0.45 + 0.25 = 0.7$

$1 - 0.7 = 0.3$

$0.45 = 18$

$\div 9$ $0.05 = 2$ $\div 9$

$\times 4$ $0.2 = 8$ $\times 4$

$3x = 0.3$

$x = 0.1$

$2x = 0.2$

8

(4)

A marble is going to be taken at random from a box of marbles.
The probability that the marble will be silver is 0.5

There must be an even number of marbles in the box.

(b) Explain why.

If the probability is 0.5 then half the marbles must be silver. Therefore there must be an even number of counters as you can't halve an odd number of counters.

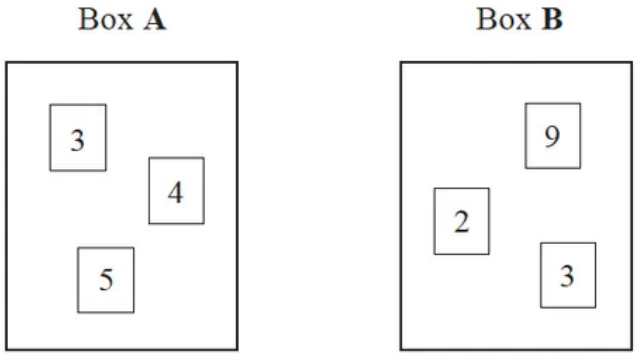
(1)

**(Total for Question 24 is 5 marks)**

*[Edexcel, GCSE, Summer 2018, Paper 3F, Q24]*

**6**

There are 3 cards in Box **A** and 3 cards in Box **B**.
There is a number on each card.




Ryan takes at random a card from Box **A** and a card from Box **B**.
He adds together the numbers on the two cards to get a total score.

Work out the probability that the total score is an odd number.

3 + 2 = 5

5 + 2 = 7

4 + 9 = 13

4 + 3 = 7

4 odd

3 + 3 = 6

3 + 9 = 12

4 + 2 = 6

5 + 9 = 14

5 + 3 = 8

5 even

4/9

**(Total for Question 17 is 2 marks)**

*[Edexcel, GCSE, Autumn 2017, Paper 1F, Q17]*

**7**

When a drawing pin is dropped it can land point down or point up.

Lucy, Mel and Tom each dropped the drawing pin a number of times.

The table shows the number of times the drawing pin landed point down and the number of times the drawing pin landed point up for each person.

| | Lucy | Mel | Tom | Total |
|---|---|---|---|---|
| **point down** | 31 | 53 | 16 | 100 |
| **point up** | 14 | 27 | 9 | 50 |
| | 45 | 80 | 25 | 150 |

Rachael is going to drop the drawing pin once.

(a) Whose results will give the best estimate for the probability that the drawing pin will land point up?
Give a reason for your answer.

Mel as she did this the most.

(1)

Stuart is going to drop the drawing pin twice.

(b) Use all the results in the table to work out an estimate for the probability that the drawing pin will land point up the first time and point down the second time.

Point up = $\frac{50}{150} = \frac{1}{3}$

Point down = $\frac{100}{150} = \frac{2}{3}$

$\frac{1}{3} \times \frac{2}{3} = \frac{2}{9}$

(2)

**(Total for Question 26 is 3 marks)**

*[Edexcel, GCSE, Autumn 2017, Paper 3F, Q26]*

**8**

The table shows the probabilities that a biased dice will land on 2, on 3, on 4, on 5 and on 6

| Number on dice | 1 | 2 | 3 | 4 | 5 | 6 |
|---|---|---|---|---|---|---|
| Probability | 0·31 | 0.17 | 0.18 | 0.09 | 0.15 | 0.1 |

Neymar rolls the biased dice 200 times.

Work out an estimate for the total number of times the dice will land on 1 or on 3

$0.17 + 0.18 + 0.09 + 0.15 + 0.10 = 0.69$

$1 - 0.69 = 0.31$

$0.31 + 0.18 = 0.49$

$0.49 \times 200 = 98$

98

**(Total for Question 17 is 3 marks)**

*[Edexcel, GCSE, Summer 2017, Paper 2F, Q17]*

**9**

There are 15 sweets in a jar.
4 of the sweets are red.

Jill takes at random a sweet from the jar.

(a) Write down the probability that the sweet is red.

$\frac{4}{15}$

(1)

There are only green counters and blue counters in a bag.

A counter is taken at random from the bag.
The probability that the counter is green is 0.3

(b) Find the probability that the counter is blue.

$1 - 0.3 = 0.7$

(1)

**(Total for Question 13 is 2 marks)**

*[Edexcel, GCSE, Summer 2022, Paper 1F, Q13]*