

GCSE Mathematics

Worksheet: Systematic listing · Calculator

TIME 35 min	TOTAL 30 marks	CALCULATOR Allowed	DIFFICULTY Easy, Medium
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Topics: Systematic listing

NAME	CLASS	DATE
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- Use black ink or ball-point pen.
- Answer all questions. Answer the questions in the spaces provided – there may be more space than you need.
- Calculators may be used. If your calculator does not have a π button, take the value of π to be 3.142 unless the question instructs otherwise.
- Diagrams are NOT accurately drawn, unless otherwise indicated.
- You must show all your working.

1

A café sells these starters and main courses.

Starters: melon, soup, salad

Main courses: fish, pasta

Femi chooses one starter and one main course.

(a) List all the possible combinations Femi can choose.

(2)

(b) The café adds one more main course to the menu.

How many different combinations of one starter and one main course are there now?

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(1)

(Total for Question 1 is 3 marks)

2

Spinner A is numbered 1, 2 and 3. Spinner B is numbered 2 and 3.

Amir spins both spinners and adds the two numbers to get a total.

(a) List all the possible outcomes, writing the number on spinner A first.

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(2)

(b) How many of the outcomes give a total of 5?

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(1)

(Total for Question 2 is 3 marks)

3

A café sells these starters and main courses.

Starters: soup, melon, garlic bread

Main courses: fish, burger

Maya chooses one starter and one main course.

(a) List all the possible combinations Maya can choose.

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(2)

(b) The café adds one more main course to the menu.

How many different combinations of one starter and one main course are there now?

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(1)

(Total for Question 3 is 3 marks)

4

Spinner A is numbered 1, 2, 3 and 4. Spinner B is numbered 1 and 3.

Tariq spins both spinners and adds the two numbers to get a total.

(a) List all the possible outcomes, writing the number on spinner A first.

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(2)

(b) How many of the outcomes give a total of 4?

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(1)

(Total for Question 4 is 3 marks)

5

Erin has three cards. There is a number on each card.

2	3	7
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Erin uses all three cards to make 3-digit numbers.

(a) List all the different 3-digit numbers Erin can make.

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(2)

(b) How many of these numbers are even?

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(1)

(Total for Question 5 is 3 marks)

6

A café sells these starters and main courses.

Starters: melon, garlic bread, salad

Main courses: pizza, pasta, burger

Sofia chooses one starter and one main course.

(a) List all the possible combinations Sofia can choose.

(2)

(b) The café adds one more main course to the menu.

How many different combinations of one starter and one main course are there now?

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(1)

(Total for Question 6 is 3 marks)

7

A café sells these starters and main courses.

Starters: soup, melon

Main courses: fish, curry

Bella chooses one starter and one main course.

(a) List all the possible combinations Bella can choose.

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(2)

(b) The café adds one more main course to the menu.

How many different combinations of one starter and one main course are there now?

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(1)

(Total for Question 7 is 3 marks)

8

Tariq has three cards. There is a number on each card.

5 **7** **8**

Tariq uses all three cards to make 3-digit numbers.

(a) List all the different 3-digit numbers Tariq can make.

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(2)

(b) How many of these numbers are even?

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(1)

(Total for Question 8 is 3 marks)

9

A café sells these starters and main courses.

Starters: melon, soup

Main courses: pasta, curry

Erin chooses one starter and one main course.

(a) List all the possible combinations Erin can choose.

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(2)

(b) The café adds one more main course to the menu.

How many different combinations of one starter and one main course are there now?

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(1)

(Total for Question 9 is 3 marks)

10

A café sells these starters and main courses.

Starters: garlic bread, soup, melon

Main courses: burger, pizza, pasta

Isla chooses one starter and one main course.

(a) List all the possible combinations Isla can choose.

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(2)

(b) The café adds one more main course to the menu.

How many different combinations of one starter and one main course are there now?

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(1)

(Total for Question 10 is 3 marks)

END OF QUESTIONS

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Mark scheme

GCSE Mathematics · Worksheet: Systematic listing · 30 marks

Question 1 (3 marks)

(a) [2 marks]

Answer: melon and fish; melon and pasta; soup and fish; soup and pasta; salad and fish; salad and pasta

- B2 for all 6 combinations and no extras

Notes: B1 for at least 4 correct combinations.

Worked solution: Take each starter in turn with every main course: melon and fish; melon and pasta; soup and fish; soup and pasta; salad and fish; salad and pasta

(b) [1 mark]

Answer: 9

- B1 for 9

Worked solution: $3 \times 3 = 9$

Question 2 (3 marks)

(a) [2 marks]

Answer: (1, 2), (1, 3), (2, 2), (2, 3), (3, 2), (3, 3)

- B2 for all 6 outcomes and no extras

Notes: B1 for at least 4 correct outcomes.

Worked solution: (1, 2), (1, 3), (2, 2), (2, 3), (3, 2), (3, 3)

(b) [1 mark]

Answer: 2

- B1 for 2 (ft their list)

Worked solution: (2, 3), (3, 2)

Question 3 (3 marks)

(a) [2 marks]

Answer: soup and fish; soup and burger; melon and fish; melon and burger; garlic bread and fish; garlic bread and burger

- B2 for all 6 combinations and no extras

Notes: B1 for at least 4 correct combinations.

Worked solution: Take each starter in turn with every main course: soup and fish; soup and burger; melon and fish; melon and burger; garlic bread and fish; garlic bread and burger

(b) [1 mark]

Answer: 9

- B1 for 9

Worked solution: $3 \times 3 = 9$

Question 4 (3 marks)

(a) [2 marks]

Answer: (1, 1), (1, 3), (2, 1), (2, 3), (3, 1), (3, 3), (4, 1), (4, 3)

- B2 for all 8 outcomes and no extras

Notes: B1 for at least 6 correct outcomes.

Worked solution: (1, 1), (1, 3), (2, 1), (2, 3), (3, 1), (3, 3), (4, 1), (4, 3)

(b) [1 mark]

Answer: 2

- B1 for 2 (ft their list)

Worked solution: (1, 3), (3, 1)

Question 5 (3 marks)

(a) [2 marks]

Answer: 237, 273, 327, 372, 723, 732

- **B2** for all 6 numbers and no extras: 237, 273, 327, 372, 723, 732

Notes: B1 for at least 4 correct numbers (ignore repeats).

Worked solution: Work systematically, starting with each card in turn: 237, 273, 327, 372, 723, 732

(b) [1 mark]

Answer: 2

- **B1** for 2 (ft their list)

Worked solution: The even numbers end in an even digit: 372, 732.

Question 6 (3 marks)

(a) [2 marks]

Answer: melon and pizza; melon and pasta; melon and burger; garlic bread and pizza; garlic bread and pasta; garlic bread and burger; salad and pizza; salad and pasta; salad and burger

- **B2** for all 9 combinations and no extras

Notes: B1 for at least 7 correct combinations.

Worked solution: Take each starter in turn with every main course: melon and pizza; melon and pasta; melon and burger; garlic bread and pizza; garlic bread and pasta; garlic bread and burger; salad and pizza; salad and pasta; salad and burger

(b) [1 mark]

Answer: 12

- **B1** for 12

Worked solution: $3 \times 4 = 12$

Question 7 (3 marks)

(a) [2 marks]

Answer: soup and fish; soup and curry; melon and fish; melon and curry

- B2 for all 4 combinations and no extras

Notes: B1 for at least 2 correct combinations.

Worked solution: Take each starter in turn with every main course: soup and fish; soup and curry; melon and fish; melon and curry

(b) [1 mark]

Answer: 6

- B1 for 6

Worked solution: $2 \times 3 = 6$

Question 8 (3 marks)

(a) [2 marks]

Answer: 578, 587, 758, 785, 857, 875

- B2 for all 6 numbers and no extras: 578, 587, 758, 785, 857, 875

Notes: B1 for at least 4 correct numbers (ignore repeats).

Worked solution: Work systematically, starting with each card in turn: 578, 587, 758, 785, 857, 875

(b) [1 mark]

Answer: 2

- B1 for 2 (ft their list)

Worked solution: The even numbers end in an even digit: 578, 758.

Question 9 (3 marks)

(a) [2 marks]

Answer: melon and pasta; melon and curry; soup and pasta; soup and curry

- B2 for all 4 combinations and no extras

Notes: B1 for at least 2 correct combinations.

Worked solution: Take each starter in turn with every main course: melon and pasta; melon and curry; soup and pasta; soup and curry

(b) [1 mark]

Answer: 6

- B1 for 6

Worked solution: $2 \times 3 = 6$

Question 10 (3 marks)

(a) [2 marks]

Answer: garlic bread and burger; garlic bread and pizza; garlic bread and pasta; soup and burger; soup and pizza; soup and pasta; melon and burger; melon and pizza; melon and pasta

- B2 for all 9 combinations and no extras

Notes: B1 for at least 7 correct combinations.

Worked solution: Take each starter in turn with every main course: garlic bread and burger; garlic bread and pizza; garlic bread and pasta; soup and burger; soup and pizza; soup and pasta; melon and burger; melon and pizza; melon and pasta

(b) [1 mark]

Answer: 12

- B1 for 12

Worked solution: $3 \times 4 = 12$
