2.104 Two-Way Tables and Venn Diagram Reasoning: Test Pack

Total Marks

GL ASSESSMENT GL-11PLUS-MATHS · Calculators not allowed · about 30 minutes

Name: _____ Date: ____ / ____ / _____

Answer ALL questions. Show all your working.

1 A survey of 28 pupils asked which of two games they liked. The results were recorded in this table.

	Football	Cricket
Boys	11	4
Girls	9	4

How many pupils like cricket?

- ☐ A) 4
- ☐ B) 9
- ☐ C) 8
- ☐ D) 15
- ☐ E) 20

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2 In a class of 42 pupils, 25 play football, 11 play tennis and 2 do both. How many pupils do neither?

- ☐ A) 10
- ☐ B) 36
- ☐ C) 7
- ☐ D) 8
- ☐ E) 6

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3 In a class of 20 pupils, 13 study French, 10 study Spanish and 5 do both. How many pupils do at least one of the activities?

- ☐ A) 19
- ☐ B) 18
- ☐ C) 2
- ☐ D) 23
- ☐ E) 7

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4 In a class of 29 pupils, 13 play football, 20 play tennis and 7 do both. How many pupils do only the second activity (play tennis)?

- ☐ A) 13
- ☐ B) 33
- ☐ C) 26
- ☐ D) 12
- ☐ E) 10

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5 In a class of 38 pupils, 12 play football, 28 play tennis and 8 do both. How many pupils do neither?

- ☐ A) 5
- ☐ B) 7
- ☐ C) 40
- ☐ D) 14
- ☐ E) 6

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6 In a class of 38 pupils, 14 study French, 30 study Spanish and 13 do both. How many pupils do only the second activity (study Spanish)?

- ☐ A) 31
- ☐ B) 44
- ☐ C) 20
- ☐ D) 1
- ☐ E) 17

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7 In a class of 33 pupils, 25 have a dog, 10 have a cat and 4 do both. How many pupils do only the first activity (have a dog)?

- [ ] A) 21
- [ ] B) 6
- [ ] C) 35
- [ ] D) 31
- [ ] E) 22

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8 In a class of 26 pupils, 18 have a dog, 11 have a cat and 8 do both. How many pupils do neither?

- [ ] A) 13
- [ ] B) 5
- [ ] C) 4
- [ ] D) 10
- [ ] E) 29

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9 In a class of 34 pupils, 9 have a dog, 13 have a cat and 6 do both. How many pupils do at least one of the activities?

- [ ] A) 18
- [ ] B) 22
- [ ] C) 16
- [ ] D) 15
- [ ] E) 12

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10 In a class of 60 pupils, 13 have a dog, 49 have a cat and 4 do both. How many pupils do only the first activity (have a dog)?

- [ ] A) 45
- [ ] B) 6
- [ ] C) 62
- [ ] D) 10
- [ ] E) 9

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11 In a class of 52 pupils, 16 have a dog, 26 have a cat and 8 do both. How many pupils do only the second activity (have a cat)?

- ☐ A) 19
- ☐ B) 18
- ☐ C) 42
- ☐ D) 26
- ☐ E) 10

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12 In a survey of 40 pupils the table shows whether they own a bike.

	Owns bike Yes	Owns bike No
Cats	12	5
Dogs	6	17

How many pupils own a bike?

- ☐ A) 25
- ☐ B) 19
- ☐ C) 17
- ☐ D) 18
- ☐ E) 28

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13 In a class of 53 pupils, 8 have a dog, 12 have a cat and 7 do both. How many pupils do at least one of the activities?

- ☐ A) 20
- ☐ B) 13
- ☐ C) 33
- ☐ D) 12
- ☐ E) 14

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14 In a class of 53 pupils, 14 study French, 15 study Spanish and 9 do both. How many pupils do at least one of the activities?

- ☐ A) 24
- ☐ B) 5
- ☐ C) 29
- ☐ D) 21
- ☐ E) 20

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15 In a class of 36 pupils, 18 study French, 16 study Spanish and 13 do both. How many pupils do at least one of the activities?

- ☐ A) 2
- ☐ B) 34
- ☐ C) 20
- ☐ D) 21
- ☐ E) 5

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16 In a class of 49 pupils, 9 have a dog, 36 have a cat and 3 do both. How many pupils do only the first activity (have a dog)?

- ☐ A) 45
- ☐ B) 42
- ☐ C) 4
- ☐ D) 5
- ☐ E) 6

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17 In a class of 58 pupils, 23 have a dog, 48 have a cat and 18 do both. How many pupils do only the second activity (have a cat)?

- ☐ A) 71
- ☐ B) 23
- ☐ C) 30
- ☐ D) 29
- ☐ E) 31

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18 In a class of 47 pupils, 31 play football, 12 play tennis and 5 do both. How many pupils do neither?

- ☐ A) 4
- ☐ B) 43
- ☐ C) 14
- ☐ D) 8
- ☐ E) 9

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19 In a class of 54 pupils, 44 study French, 26 study Spanish and 25 do both. How many pupils do only the first activity (study French)?

- [ ] A) 70
- [ ] B) 34
- [ ] C) 19
- [ ] D) 20
- [ ] E) 18

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20 In a class of 60 pupils, 13 play football, 35 play tennis and 5 do both. How many pupils do neither?

- [ ] A) 18
- [ ] B) 8
- [ ] C) 17
- [ ] D) 48
- [ ] E) 12

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21 In a class of 51 pupils, 10 have a dog, 24 have a cat and 3 do both. How many pupils do at least one of the activities?

- [ ] A) 31
- [ ] B) 17
- [ ] C) 30
- [ ] D) 34
- [ ] E) 7

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22 In a class of 45 pupils, 37 have a dog, 28 have a cat and 25 do both. How many pupils do at least one of the activities?

- [ ] A) 30
- [ ] B) 39
- [ ] C) 40
- [ ] D) 65
- [ ] E) 12

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23 In a class of 30 pupils, 19 like pizza, 20 like pasta and 17 do both. How many pupils do neither?

- ☐ A) 25
- ☐ B) 22
- ☐ C) 39
- ☐ D) 2
- ☐ E) 8

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24 In a class of 42 pupils, 29 study French, 14 study Spanish and 8 do both. How many pupils do only the first activity (study French)?

- ☐ A) 35
- ☐ B) 15
- ☐ C) 21
- ☐ D) 22
- ☐ E) 43

---

25 In a class of 32 pupils, 9 have a dog, 9 have a cat and 7 do both. How many pupils do at least one of the activities?

- ☐ A) 10
- ☐ B) 11
- ☐ C) 14
- ☐ D) 18
- ☐ E) 28

---

26 In a class of 33 pupils, 20 like pizza, 14 like pasta and 5 do both. How many pupils do only the second activity (like pasta)?

- ☐ A) 8
- ☐ B) 10
- ☐ C) 9
- ☐ D) 29
- ☐ E) 34

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27 The table shows pupils taking French and German.

	German	Not German	Total
Takes French	7	5	12
Does not take	6	12	18
Total	13	17	30

(a) How many pupils take German? **(1)**

(b) How many pupils take neither French nor German? **(1)**

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28 In a school of 60 pupils, 30 study French, 28 study Spanish and 12 study both. A pupil is chosen at random. Work out the probability that the pupil studies exactly one of the two languages. Give your answer as a fraction in simplest form.

(3)

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29 A school asked 100 pupils whether they prefer early lunch, late lunch, or no preference. The results were recorded as: early 42, late 38, no preference 20. The headteacher realises the counts must add to 100. Is the table complete and consistent? If not, suggest a possible reason why and correct the numbers so they sum to 100.

(3)

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Mark scheme · 2.104 Two-Way Tables and Venn Diagram Reasoning: Test Pack

A correct answer earns full marks unless the question asks for working, a method, proof or explanation.

Question 1

correct option C (8) cao **B1**

Answer: C) 8 (4 boys + 4 girls = 8 pupils like cricket.)

Question 2

correct option D (8) cao **B1**

Answer: D) 8

Question 3

correct option B (18) cao **B1**

Answer: B) 18

Question 4

correct option A (13) cao **B1**

Answer: A) 13

Question 5

correct option E (6) cao **B1**

Answer: E) 6

Question 6

correct option E (17) cao **B1**

Answer: E) 17

Question 7

correct option A (21) cao **B1**

Answer: A) 21

Question 8

correct option B (5) cao **B1**

Answer: B) 5

Question 9

correct option C (16) cao **B1**

Answer: C) 16

Question 10

correct option E (9) cao **B1**

Answer: E) 9

Question 11

correct option B (18) cao **B1**

Answer: B) 18

Question 12

correct option D (18) cao **B1**

Answer: D) 18

Question 13

correct option B (13) cao **B1**

Answer: B) 13

Question 14

correct option E (20) cao **B1**

Answer: E) 20

Question 15

correct option D (21) cao **B1**

Answer: D) 21

Question 16

correct option E (6) cao **B1**

Answer: E) 6

Question 17

correct option C (30) cao **B1**

Answer: C) 30

Question 18

correct option E (9) cao **B1**

Answer: E) 9

Question 19

correct option C (19) cao **B1**

Answer: C) 19

Question 20

correct option C (17) cao **B1**

Answer: C) 17

Question 21

correct option A (31) cao **B1**

Answer: A) 31

Question 22

correct option C (40) cao **B1**

Answer: C) 40

Question 23

correct option E (8) cao **B1**

Answer: E) 8

Question 24

correct option C (21) cao **B1**

Answer: C) 21

Question 25

correct option B (11) cao **B1**

Answer: B) 11

Question 26

correct option C (9) cao **B1**

Answer: C) 9

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Question 27

(a) 13 cao **B1**

(a) Answer: 13

(b) 12 cao **B1**

(b) Answer: 12

Question 28

calculate at least one or exactly one expression: exactly one = 30 + 28 - 2*12 **M1**

substitution: exactly one = 30 + 28 - 24 = 34 **M1**

34/60 = 17/30 cao **A1**

Answer: 17/30 (Exactly one = 30 + 28 - 2 x 12 = 34, probability = 34/60 = 17/30)

Question 29

state that 42 + 38 + 20 = 100 seen or note if arithmetic error **M1**

42 + 38 + 20 = 100 cao **A1**

if inconsistent suggest a plausible correction (e.g. miscounted 20 should be 20 and explain) or state consistent as given **B1**

Answer: The counts add to 100 (42 + 38 + 20 = 100), so the table is complete and consistent.

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