

WA7MPSP4

Probability and statistics

Core + Challenge

Venn Diagrams and Stem-and-Leaf Plots — Marking Key

I can represent and interpret data in Venn diagrams and stem-and-leaf plots, and use them to answer questions.

For tutors and parents. Award method marks for correct working even if the final answer is wrong.

Marks summary

Section A Fluency: 16 Section B Core: 23 Section C Reasoning: 9 Section D Challenge: 9 **Total: 57**

Fluency: 1 mark each; accept an equivalent unsimplified answer for half credit at tutor's discretion.

A Fluency *answers and working*

/ 16 marks

Q	Answer	Working
1	30	$12 + 5 + 8 + 5$
2	17	$12 + 5$
3	13	$5 + 8$
4	5	overlap
5	5	outside circles
6	12	sport only
7	8	right region
8	$\frac{1}{6}$	$\frac{5}{30}$
9	13	count leaves
10	12	$1 \mid 2$
11	47	$4 \mid 7$
12	35	$47 - 12$
13	35	appears 3 times
14	30	7th value
15	7	30, 34, 35, 35, 35, 41, 47
16	4	21, 23, 23, 28

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B

Core *answers, working and marks*

/ 23 marks

Q	Answer	Working / sample response	Marks
1	Cats only 10, both 4, dogs only 7, neither 4	$25 - (10 + 4 + 7) = 4$ <i>1 mark: only regions</i> <i>1 mark: both</i> <i>1 mark: neither = 4</i>	3
2	2 3 7 9; 3 1 1 5 8; 4 2 5; 5 0; median 33	Middle two values: 31 and 35 <i>1 mark: stems</i> <i>1 mark: ordered leaves + key</i> <i>1 mark: median 33</i>	3
3	$\frac{17}{30}$	17 of 30 play sport <i>1 mark: 17</i> <i>1 mark: $\frac{17}{30}$</i>	2
4	Overlap 6, 12, 18; neither: 7	A: 3, 6, 9, 12, 15, 18 (6); B: 10 numbers; A or B: $6 + 10 - 3 = 13$; $20 - 13 = 7$ <i>1 mark: overlap</i> <i>1 mark: counts</i> <i>1 mark: 7</i>	3
5	6	34, 35, 35, 35, 41, 47 <i>1 mark: list</i> <i>1 mark: 6</i>	2
6	(a) categorical (b) numerical (c) numerical (d) categorical	Categories vs numbers <i>2 marks: all four (1 mark for two)</i>	2
7	4 1 2 5 7 9; 41, 42, 45, 47, 49	Order the leaves <i>1 mark each</i>	2
8	It keeps every actual score	You can still find the median and range exactly. <i>2 marks</i>	2
9	10	Coffee or tea: $22 + 15 - 7 = 30$; $40 - 30$ <i>1 mark: 30</i> <i>1 mark: 10</i>	2
10	$26\frac{2}{3}\%$ (about 26.7%)	$\frac{8}{30} \times 100\%$ <i>1 mark: $\frac{8}{30}$</i> <i>1 mark: percentage</i>	2

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C Reasoning *sample answers and marking criteria*

/ 9 marks

Q	Answer	Working / sample response	Marks
1	To show place value	3 5 could mean 35, 3.5 or 350. <i>2 marks</i>	2
2	Each person is in one region only	Adding both circle totals would count 'both' twice. <i>2 marks</i>	2
3	Stem is tens, leaf is units	3 tens and 5 units = 35. <i>2 marks</i>	2
4	Yes	e.g. A = odd numbers, B = multiples of 4: the overlap is empty. <i>1 mark: yes</i> <i>2 marks: valid example</i>	3

D Challenge *solutions and marking criteria*

/ 9 marks

Q	Answer	Working / sample response	Marks
1	7	Sport or music = 26; $18 + 15 - 26 = 7$ <i>1 mark: 26</i> <i>1 mark: method</i> <i>1 mark: 7</i>	3
2	20	Total 100; $100 - 80 = 20$ <i>1 mark: 100</i> <i>1 mark: 20</i>	2
3	Sport only 20, music only 10	Only regions total 30; split 2 : 1 <i>1 mark: 30</i> <i>1 mark: 20 and 10</i>	2
4	e.g. 12, 18, 22, 24, 26, 30, 35, 42	Middle two average 25; $\text{max} - \text{min} = 30$ <i>1 mark: median</i> <i>1 mark: range</i>	2