CAMBRIDGE
International Education

Cambridge International AS & A Level

THINKING SKILLS **9694/33**

Paper 3 Problem Analysis and Solution **May/June 2026**

MARK SCHEME

Maximum Mark: 50

Published

This mark scheme contains the instructions and marking guidance that our examiners used to mark candidate responses for this component.

Before they start marking, examiners complete a standardisation process. They review a range of candidate responses and discuss the mark scheme in detail to agree which answers can and cannot be accepted. Examiners award marks where it is clear that candidate responses have met the requirements of the mark scheme. These requirements may vary between different components or different versions of the same component, depending on the exact requirements of the question and the candidate responses seen during the standardisation process.

Sometimes, our mark schemes may allow marks to be awarded to responses which contain elements that are factually incorrect or for content not covered by the syllabus. We do this in response to the demands of a specific question to support candidates and make sure that our assessments are fair. However, these allowances should not be used as a guide for teaching and learning.

We cannot discuss the mark scheme with schools, and we recommend that schools read the mark scheme together with the assessment material and the Principal Examiner Report for Teachers.

This document consists of **12** printed pages.

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[Turn over

General marking principles

All examiners must apply these marking principles when marking candidate responses.

1	Examiners must award marks for each response in line with: • the specific **content** defined in the mark scheme • the specific **skills** defined in the mark scheme or in the level descriptions • the **standard of response** required as exemplified by the standardisation scripts.
2	Examiners must award **whole marks** (not half marks, or other fractions).
3	Examiners must award marks **positively**. This means that: • marks are not deducted for errors or omissions • marks are awarded for correct/valid answers as defined in the mark scheme and also for **other valid answers** which go beyond the scope of the syllabus and mark scheme referring to your team leader as appropriate • the quality of spelling, punctuation and grammar are judged **only** when the mark scheme indicates that these features are **specifically assessed** in the question. However, the meaning of all responses must be unambiguous.
4	Examiners must **consistently** apply the requirements of the mark scheme and any rules for what to do when candidates have not followed instructions correctly.
5	Examiners must use the **full range of marks** defined in the mark scheme, unless limited by the quality of the candidate responses seen.
6	Examiners must award marks according to the mark scheme and **must not** award marks with grade thresholds or grade descriptions in mind.

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Annotations guidance for centres

Examiners use a system of annotations as a shorthand for communicating their marking decisions to one another. Examiners are trained during the standardisation process on how and when to use annotations. The purpose of annotations is to inform the standardisation and monitoring processes and guide the supervising examiners when they are checking the work of examiners within their team. The meaning of annotations and how they are used is specific to each component and is understood by all examiners who mark the component.

We publish annotations in our mark schemes to help centres understand the annotations they may see on copies of scripts. Note that there may not be a direct correlation between the number of annotations on a script and the mark awarded. Similarly, the use of an annotation may not be an indication of the quality of the response.

The annotations listed below were available to examiners marking this component in this series.

Annotations

Annotation	Meaning
✓	Correct item
✗	Incorrect item
1	Individual mark of partial credit
2	Double mark of partial credit
^	Essential element of answer/working missing
NGE	Judged to be not good enough to earn the relevant credit
BOD	Benefit of doubt
FT	Correct follow through
TE	Transcription error
SC	Special case

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Annotation	Meaning
SEEN	Working seen but no credit awarded; blank page checked
Highlighter	Use anywhere it is helpful to clarify the marking

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NOTES FOR MARKERS

Working

Where a final answer is underlined in the mark scheme, full marks are awarded for a correct answer, regardless of whether there is any supporting working, unless an exception is noted in the mark scheme.

Supporting working is **not** needed to gain full marks, unless otherwise stated in the mark scheme.

If working clearly shows, beyond any doubt, that a correct answer derives purely from incorrect reasoning, that answer may be invalidated, unless otherwise stated in the mark scheme.

For partial credit, the evidence needed to award the mark will usually be shown on its own line in the mark scheme, or else will be defined in italic text.

For explanations and verbal justifications, apply the principle of ‘words to that effect’.

Units

Unless required by the question or mark scheme, units such as $ do not need to be seen to award the marks.

Incorrectly labelled work

If the candidate has labelled their work with the wrong Question/part number, highlight the label(s) and add a comment to flag it. This will help avoid confusion for anyone checking the script later on.

No response

If there is any attempt at a solution award 0 marks not NR. ‘–’ or ‘?’ constitute no attempt at a solution.

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Abbreviations

The following abbreviations may be used in a mark scheme:

AG	answer given (on question paper)
awrt	answer which rounds to
dep	mark depends on earlier, asterisked (*), mark
FA	final answer
ft	follow through (from earlier error)
oe	or equivalent
SC	special case
soi	seen or implied

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Question	Answer	Marks	Guidance
1(a)	Each employee earns 1 + 2 × 2 = 5 points per day, so 25 points for the week **[1]** 100 points = $2 per point, so the total payment will be: $100 + 25 × $2 **[1]** = $150 **AG**	**2**	
1(b)	Billy	**1**	
1(c)(i)	If Anne earns no more points, but Billy, Carole and Dylan all earn 5 points, the total will be 14 + 19 + 20 + 21 = 74 points **[1]** Each point will be worth $3 Bonus = 14 × $3 = $42 *SC: 1 mark for (pay and bonus) $142 without working*	**2**	Ignore subsequent addition of pay
1(c)(ii)	So far 14 + 14 + 15 + 16 = 59 points have been scored Bonus will be $3 per point if there are 63 or more points scored in total and $4 per point if there are 62 or fewer points scored in total **[1]** Anne will get largest bonus if she scores 3 points and the others score nothing 17 × $4 = $68 *SC: 1 mark for (pay and bonus) $168 without working* *SC: 1 mark for FA $57 (Anne scores 5 points)*	**2**	Implied by use of 17 points in total for Anne Ignore subsequent addition of pay
1(d)	(If all of the employees receive the same bonus then the amount awarded will be a multiple of $4) $250 is not a multiple of $4	**1**	

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Question	Answer	Marks	Guidance
1(e)	The full $250 will be given out if the total number of points is (1, 2,) 5, 10, 25, 50, (125 or 250) **[1]** *OR* Any valid combination (3 employees earn same and 1 employee earns fewer points) for 10,25 or 50 total **[1]** (1, 2 and) 5 cannot be achieved with 3 at a higher value and 1 at a lower value, so it must be 10 points **[1]**	**2**	Sufficient to say 'divides' or 'is factor of' Ignore working for final answer

Question	Answer	Marks	Guidance
2(a)	20:02	**1**	Accept 62 minutes
2(b)	Citrines	**1**	
2(c)	(2,) <u>5 , 7 , 8</u> (, 9) *1 mark for sight of 31 (total goals scored) AND 9 (goals in fifth match)* *1 mark for five distinct numbers in ascending order adding to 31*	**2**	Assume (2,) if only four given
2(d)(i)	Emeralds (drew yesterday, so) have gained 21–2 (19) points from 4 matches **[1]** This can (only) be 3 × 5 and 1 × 4 **[1]**	**2**	Deduced from table not answer given
2(d)(ii)	Amethysts scored 10 goals / gained 5 points yesterday **[1]** They have an even number of points, so the other win must also have gained 5 points **[1]**	**2**	Or show that cannot make 14 without two 5s

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Question	Answer	Marks	Guidance
2(e)	29 matches have been played **[1]** 25 matches have been won, so 4 have been drawn *OR* Emeralds have drawn 1 match Amethysts have drawn 2 matches Diamonds have drawn 1 match Garnets have drawn 1 match Jaspers have drawn 1 match Citrines have drawn 1 match Zircons have drawn 1 match (otherwise the total number of drawn *matches* would not be an integer) *1 mark for at least 4 of these detailed* so 4 matches have been drawn *SC: 1 mark FA 8 (counting each draw twice)*	**2**	
2(f)	Aday	**1**	
2(g)	25 minutes (0 seconds) *1 mark for sight of any two of the following periods:* *7 minutes 30 seconds / from 00:00 to 07:30* *9 minutes 45 seconds / from 22:00 to 31:45* *7 minutes 45 seconds / from 36:15 to 44:00*	**2**	15 m 15 s, 17 m 15 s or 17 m 30 s implies this mark
2(h)	Dean and Joplin have not been on court together, so: • Dean must have scored the 2nd goal • Dean could not have scored goals 3–7 • Dean must have scored the 8th goal • Dean must have scored the 9th goal Dean scored 3 goals *2 marks for 3 goals with full explanation* *1 mark for any two of the three bullet points above*	**2**	

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Question	Answer	Marks	Guidance
3(a)(i)	Given in alphabetical order, any one of: Cells: 0 – 5 – (2) – 4 – 3 – (0); Boxes (5) – 9 – (7) – (7) – 11 – (3) Cells: 1 – 4 – (2) – 5 – 2 – (0); Boxes (5) – 9 – (7) – (7) – 11 – (3) Cells: 2 – 3 – (2) – 6 – 1 – (0); Boxes (5) – 9 – (7) – (7) – 11 – (3) Cells: 3 – 2 – (2) – 7 – 0 – (0); Boxes (5) – 9 – (7) – (7) – 11 – (3)	**1**	May see A = 0 etc. If more than one, mark the last.
3(a)(ii)	<u>4, 5, 6, 7</u> *1 mark for any three correct and none incorrect*	**2**	Any order
3(b)(i)	Any example where U > W + X	**1**	All positive whole numbers
3(b)(ii)	1, 2, 3, 4, 5, 6	**1**	Accept numbers less than 7 or similar Allow a 0 if 0 was in otherwise valid 3bi
3(c)(i)	Minimum value (for V) arises from 6 in B **[1]** Then C+D=2 (since y=8) and E can be 0, so 2 **[1]**	**2**	Implied by B cannot be more than W (6) Sufficient to provide a valid example where B=6 Ignore working for final answer
3(c)(ii)	Cell E is unconstrained	**1**	Requires identification the cell
3(d)	<u>7, 8, 9, 10</u> *1 mark for a set of (consecutive) numbers with either 7 as the minimum or 10 as the maximum* *SC: 1 mark for 7 and 10 without numbers outside the range*	**2**	Any order

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Question	Answer	Marks	Guidance
4(a)	(10 × 3) / (0.5 × 0.5) × 50 = 6000 **AG**	**1**	Three parts must be seen
4(b)	Total number of stones: 2200 Red, 1600 Grey, 2200 Cream **[1]** These should be bought in batches of (2 × 1000 + 2 × 100), (1 × 1000 + 1 × 500 + 1 × 100) and (2 × 1000 + 2 × 100) *1 mark for any correct set of batches* Cost = \$3600 + \$2700 + \$3600 = \$<u>9900</u>	**3**	Or expressed as a sum of the cost of the batches for a colour Implied by correct cost for a colour seen
4(c)	Number of stones for 40 houses: 2200 Red, 1600 Grey, 1000 Cream Choose numbers to bring all to multiples of 500, so add 300 Red, 400 Grey, 500 Cream **[1]** Cost: \$4100 + \$3200 + \$2500 = \$9800 **[1]**	**2**	May be seen as 30, 40, 50 as additional number per house or 2500, 2000, 1500
4(d)	800 Red and 400 Grey	**1**	
4(e)	5L = \$52, 4L 2S = \$54, 3L 4S = \$51, 2L 6S = \$56, 1L 8S = \$58, 10S = \$55 *1 mark for any one these combinations with correct cost* Least cost is <u>\$51</u> *SC: 1 mark for FA \$31 (not including cost of the pot)*	**2**	

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Question	Answer	Marks	Guidance
4(f)	Least cost is obtained by using as many large plants as possible **[1]** Number of plants needed is 50 × 2 × 5 = 500 which is 166 lots of 3 plus 2 plants **[1]** Pots cost 100 × \$20 = \$2000 Total cost (166 × \$16) + (2 × \$8) + \$2000 = \$4672 *SC: 2 marks for FA \$2336 (only 1 pot per patio)* *SC: 1 mark for \$2935 seen or FA \$4935 (bulk purchase of plants in 4e proportions)*	**3**	Implied by solution where all plants are bought in a single purchase and in which no calculations involve small plants
4(g)	Cost of tiles = \$9600 **[1]** Cost of materials = \$9600 + \$'4672' (=\$14272) Lenny takes 20 hours (pots) + 300 hours (stones) so 320 hours which is 40 days labour, costing 40 × \$150 = \$6000 **[1]** Leona's required income = \$50 × 40 = \$2000, so total costs = \$22272 which is less than \$25000 **[1]** (so Yes, accept offer) *OR* Total costs = \$20272 which gives Leona \$4728. \$4728 ÷ 40 = \$118.20 per day which is more than \$50 per day **[1]** (so Yes, accept offer)	**3**	**ft** cost of their **4(d)** (working may be seen in **4(d)**) **ft** their **4(f)** \$4728 ÷ 40 > \$50 sufficient

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