



Cambridge International AS & A Level

THINKING SKILLS

Paper 1 Problem Solving

MARK SCHEME

Maximum Mark: 50

9694/11

May/June 2026

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 **13** printed pages.

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.

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
	Individual mark of partial credit
	Double mark of partial credit
	Essential element of answer/working missing
	Judged to be not good enough to earn the relevant credit
	Benefit of doubt
	Correct follow through
	Transcription error
	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

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.

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.

No response

If there is any attempt at a solution award 0 marks not NR. “-” or “?” constitute no attempt at a solution.

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

Question	Answer	Marks	Guidance
1	$(409 + 359 =) \$768$ <i>1 mark for 409 or 359 or Phelps WM and Boxer TD</i>	2	Allow clear unambiguous indication of the two names on the diagram

Question	Answer	Marks	Guidance
2(a)	<u>One-third</u> oe <i>1 mark for (area of path is) 88 (square metres) OR 22 (2-metre) squares</i> <i>If 0 scored, award 1 mark for FA 44/264 oe</i>	2	Allow any exact equivalent, e.g. 22/66, 88/264, 1 out of 3 Ignore incorrect cancelling or conversion to a percentage once you have seen the correct answer Needs to be clear that 22 is area of path in squares, not just 22 seen May be cancelled to e.g. 1/6 but 1/6 without sight of 44/264 scores 0
2(b)	$176/0.8 = \underline{220}$	1	

Question	Answer	Marks	Guidance
3(a)	<u>26</u>	1	
3(b)	$(26 + 2 \times 30 =) \underline{86}$	1	

Question	Answer	Marks	Guidance
4(a)	(Tuesday) <u>29</u> th	1	Ignore day of week and month
4(b)	<u>6800</u> m <i>1 mark for 1200 as FA or as final number in a list OR 2800 seen OR 4700 as FA</i>	2	

Question	Answer	Marks	Guidance
5(a)	<u>31</u> <i>1 mark each for up to two of 16 for B-line 9 for H-line 6 for V-line SC: 1 mark for 15, 8, 5 seen in that order B, H, V</i>	3	For any other FA, award up to a maximum of 2 marks for 16, 9, 6 as detailed Numbers must be clearly linked to the correct line. If they are not, assume they are in the order B, H, V and mark accordingly Lists of times alone do not score marks.
5(b)(i)	The minutes (past the hour) is always a multiple of 5 for the H-line while the minutes (past the hour) is never a multiple of 5 for the other lines oe	1	
5(b)(ii)	<u>08:23</u>	1	

Question	Answer	Marks	Guidance
6	<u>15th (floor)</u> <i>1 mark for 10 floors</i> <i>OR 30 seconds to travel between floors</i> <i>OR sight of 10 lots of 3 and 2 lots of 10</i>	2	Floor 10 scores only with supporting evidence Implied by 30/3 or (50 – 20)/3

Question	Answer	Marks	Guidance
7(a)	$2 \times \$30 + 3 \times \$16 + 4 \times \$11 + 2 \times \$6 = \$164$	1	
7(b)	(Total charge is $\$75 + \$72 =$) <u>$\\$147$</u> <i>1 mark for \$16, \$11, \$11, \$11, \$11, \$6, \$6</i> <i>OR \$16, \$44, \$12</i> <i>OR \$72</i>	2	
7(c)	(All grandchildren are one year older, and charges increased by \$2 each, so) charge for grandchildren is $\$22 + 3 \times \$18 + 4 \times \$13 + 1 \times \$8 = \$136$ [1] (Increase in charge for 2 adults = $\$209 - \$136 - 2 \times \$30 = \$13$, so) <u>$\\$6.50$</u> each <i>If 0 scored, award 1 mark for \$36.50 seen OR FA \$13</i>	2	No ft from (a) Seen

Question	Answer	Marks	Guidance
8(a)	Arlo pays \$45 [1] Barry pays \$36 [1] OR <i>1 mark for 36, 45 if not clear they refer to Barry, Arlo or if wrongly assigned OR for FA 81 without sight of 45 and 36 OR for 45 alone or as the first number in a list of two OR for 36 alone or as the second number in a list of two</i>	2	If Arlo 45 and Barry 36 are seen, but total 81 is ringed as FA, award 2 marks. Allow just 45, 36
8(b)	<u>210</u> (minutes) <i>1 mark for 11:00–13:00 and 14:00–15:30 identified as a pair</i>	2	Accept 3.5 hours or 3 hours 30 minutes Note that FA Fish Pond 210 minutes scores 0
8(c)	Bird Centre, Café, Insect House, Fish Pond [1] 11:30, 12:30, 13:45, 14:45 [1] <i>SC: 1 mark for Bird Centre at 11:30, Café at 12:30</i>	2	Accept abbreviations of names

Question	Answer	Marks	Guidance
9(a)	<u>\$16000</u>	1	
9(b)	<u>24</u> 1 mark for 7 in 2nd (set of questions) and 8 in 3rd (set of questions) OR 2 evaluated trials of $500x + 800y$ SC: 1 mark for $9 + 15 + 3 = 27$	2	Accept 24/30 Two trials with x and y each equal to no more than 10 Must see the 9, the 15 and the 3 and total 27
9(c)	<u>\$4536</u> and <u>\$7560</u> 1 mark for \$4536 OR \$7560 OR 36% and 60% ~~oe~~ seen OR Final Answers \$5760 AND \$9600	2	9/25 and 9/15 OR 0.36 and 0.6

Question	Answer	Marks	Guidance
10(a)	44 boys [1] 37 girls [1] <i>1 mark for 37, 44 if not clear they refer to girls, boys or if wrongly assigned OR for FA 81 without sight of 44 and 37 OR for 44 alone or as the first number in a list of two OR for 37 alone or as the second number in a list of two</i>	2	If 44 boys and 37 girls are seen, but total 81 is ringed as FA, award 2 marks. Allow just 44, 37
10(b)	<u>22</u> <i>1 mark for FA 11 or FA 16</i>	2	FA 10 scores 0 FA 10 girls scores 0

Question	Answer	Marks	Guidance
11(a)(i)	$(83/4) + (42/4) = 20 + 10 =$ <u>30</u>	1	In this question, mark the Final Answer in each part e.g. $20 + 10 = 30 \rightarrow 29$ scores 0
11(a)(ii)	$(83+42)/4 = 125/4 =$ <u>31</u>	1	
11(a)(iii)	$414/(20 \times 15) = 158/44$ <i>1 mark for 158 or 44</i> <u>3</u>	2	
11(b)	$388 + 1 - 256 =$ <u>133</u>	1	
11(c)	$74\,123 - (256 \times 256) =$ <u>8587</u>	1	

Question	Answer	Marks	Guidance
12(a)	A must be 1, 2 or 3 C and G must be 1 and 2 (in some order) So A must be 3	1	Must be a clear full explanation in words Must mention A, C and G correctly
12(b)	<u>8, 1, 5, 9, 2, 4</u> <i>2 marks for 4 correctly identified answers</i> <i>OR</i> <i>1 mark for 2 correctly identified answers</i>	3	Mark answers on answer lines first If no answers there, look at the diagram and any working.

Question	Answer	Marks	Guidance
13	(6 km/h while buying breakfast would be) 500 m [1] (Extra 3 km/h after breakfast gains 500 m) Travelling time after breakfast is 10 minutes [1] $27 - 10 - 5 = 12$ minutes before breakfast At 6 km/h = <u>1.2</u> km OR (Total distance travelled = $6 \times 27/60 =$) 2.7 km [1] $(6/60)t + (9/60) \times (22 - t) = 2.7$ $t = 0.2$ h or 12 min [1] distance to stop = 6×0.2 = <u>1.2</u> km	3	Implies first mark $6t + 9 \times (22 - t) = 2.7 \times 60 (= 162)$ Implies first mark