



# Cambridge International AS & A Level

CANDIDATE NAME

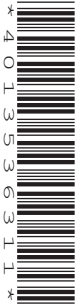


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## THINKING SKILLS

9694/11

Paper 1 Problem Solving

October/November 2025

1 hour 30 minutes

You must answer on the question paper.

No additional materials are needed.

## INSTRUCTIONS

- Answer **all** questions.
- Use a black or dark blue pen.
- Write your name, centre number and candidate number in the boxes at the top of the page.
- Write your answer to each question in the space provided.
- Do **not** use an erasable pen or correction fluid.
- Do **not** write on any bar codes.
- You may use a calculator.
- Show your working.
  - Where a final answer is incorrect or missing, you may still be awarded marks for correct steps towards a solution.
  - In some questions, if you do not show your working, full marks will not be awarded.

## INFORMATION

- The total mark for this paper is 50.
- The number of marks for each question or part question is shown in brackets [ ].

This document has **16** pages. Any blank pages are indicated.





- 1 In the city centre car park that I use regularly there is no charge for the first 30 minutes. After 30 minutes the charge is 50¢ for every 15 minutes or part of 15 minutes.

The time of each car's arrival is recorded and the charge is calculated when the car reaches the exit.

- (a) What is the longest time from arrival to the exit for which a driver would be charged \$10? [1]

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Yesterday I entered the car park at 14:08 and I reached the exit at 16:44.

- (b) How much did I have to pay? [2]

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2 There is a set of traffic lights at a pedestrian crossing on a road.

Pressing the button to cross triggers a 60 second wait, followed by 30 seconds during which the traffic lights are red and people may cross the road.

The time between the traffic lights turning green and then turning back to red is at least 120 seconds.

A large party of schoolchildren needs to cross the road. They will cross in five groups. Only one of these groups can cross the road during each 30-second crossing period.

What is the shortest possible time between the party first pressing the button and the final group of children beginning to cross the road? [2]

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- 3 The Antlers, the Jets, the Koolers and the Rustlers played each other once in the Invincible Cup. The winner of a match received 3 points and the loser received no points. If a match was drawn, each team received 1 point.

After all matches had been played, the winners of the Invincible Cup were the Rustlers, with 5 points. The Koolers had the fewest points. Only one match was won in the whole tournament.

How many points did the Koolers have? [2]

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- 4 There are five apartments in our building, and each one has one allocated parking space. The original plans show them numbered 1, 2, 3, 4, 5 but they are now 5, 1, 4, 3, 2 as a result of pairs of people swapping their spaces.

(a) What shows there must have been more than two swaps? [1]

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(b) Give an example of how the numbers could have been swapped using three swaps. [1]

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5 James likes to play tennis at the local tennis centre. Tennis courts can be booked for 1-hour sessions. It costs \$5 per hour to book a court, but it is also possible to buy a membership of the tennis centre. Membership costs \$40 per month, but members pay only \$3 per hour to book a court.

James plays tennis for the same number of hours every month. He considered buying a membership, but worked out that a membership would not save him any money.

(a) What is the largest number of hours per month that James might use the tennis centre? [2]

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The managers of the tennis centre have announced that they are changing the prices. Non-members will now have to pay \$6 per hour to book a court. Membership will now cost \$45, but members will still pay only \$3 per hour to book a court.

James will continue to play tennis for the same number of hours every month. He has now worked out that a membership will save him some money.

(b) What is the smallest number of hours per month that James might use the tennis centre? [1]

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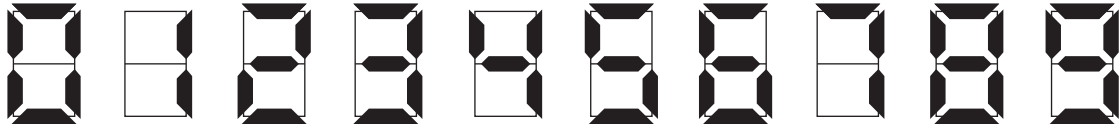
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6 Sheila has an old calculator that shows digits on a seven-segment display. All seven segments show up to make the digit 8; fewer segments show up to make the other digits. The digits as she should see them are as follows:



The battery in Sheila's calculator is getting low, and the segments in the display are beginning to fail to show up.

(a) List all the digits that the display below could be from. [1]



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(b) As the battery fails, and segments begin to fail, Sheila notices an 8 turn into another digit, then another, before ending up as a 1.

(i) Which digits could **not** be either of the intermediate ones? [1]

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(ii) List all the sequences Sheila could have seen. [3]

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7 Denise buys eggs to make breakfast at her guest house. She knows that she will need to buy between 1 and 6 boxes of eggs per week. She buys the eggs for the whole week on Sundays. Eggs can be used only for one week after being bought.

At her local market, there are three egg-sellers, who sell boxes of eggs for \$6 each. Each seller has a different offer:

- A Buy one box, get one half price
- B Three boxes for the price of two
- C \$1 off each additional box: \$6 for the first, \$5 for the second etc., up to a maximum of six boxes.

The first three weeks, Denise needs 5, 2 and 3 boxes of eggs respectively.

(a) Which seller should she go to in each of these three weeks? [2]

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After the first three weeks, all of the sellers decide that the offers will apply only if a customer buys all their eggs from them every week. Denise must now decide which seller to use for all future egg purchases, which will be equally likely to be of 1, 2, 3, 4, 5 or 6 boxes.

(b) Over a long period of egg-buying, which seller's offer would give Denise the lowest cost? [2]

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8 The Watersports Centre is open from 9:00 to 18:00 every day of the week. The centre offers sessions in canoeing, diving, swimming and windsurfing. Details about these sessions are given in the table. Any visitor must allow at least 5 minutes between any two activities.

<i>Activity</i>	<i>Days available</i>	<i>Start times of sessions</i>	<i>Length of session</i>	<i>Cost per person per session</i>
Canoeing	Monday, Wednesday, Friday, Saturday	15 and 45 minutes past each hour	30 minutes	\$12
Diving	Monday, Tuesday, Wednesday, Friday	On the hour	40 minutes	\$15
Swimming	Every day	30 minutes past each hour	45 minutes	\$21
Windsurfing	Friday, Saturday, Sunday	10 minutes past each hour	50 minutes	\$25

(a) How many swimming sessions are there each day? [1]

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A maximum of 10 people can take part in any session.

(b) What is the maximum possible income from the diving sessions in a week? [1]

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Grace took part in some canoeing and windsurfing sessions recently. The total cost of these sessions was \$307.

(c) How many canoeing sessions and how many windsurfing sessions did Grace take part in? [2]

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- 9 One of the events in today’s Fun Day at Bluebell Common is the 5-kilometre ‘puzzle run’, which has 16 runners competing this year.

The runners start, one at a time, at 6-minute intervals and at the end of each of the first four kilometres there is a ‘puzzle station’, where they are presented with a puzzle to solve. Each puzzle has a time limit of 4 minutes.

The first runner started 52 minutes ago, at 14:00, and the first three runners have already finished.

- (a) (i) At what time will the last runner start? [1]

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- (ii) How many runners have started but not yet finished? [1]

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Runners score 120 points for each puzzle successfully solved and 1 point for every second that their total time (including the time spent attempting the puzzles) is less than 50 minutes.

No runner can leave a puzzle station until they have solved the puzzle or until the 4-minute time limit is reached.

Cynthia was the first runner to finish today, 42 minutes 17 seconds after she started. She solved the fourth puzzle in 2 minutes 14 seconds, but she failed to solve any of the other three.

- (b) (i) How many points has Cynthia scored? [2]

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(ii) What was the total time taken by Cynthia to run the five 1-kilometre sections?

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10 A quiz is held every Saturday night. Each team participating must have five members.

In every round the team chooses one member to answer 10 questions.

The first five correct answers score 2 points each. Any further correct answers score 3 points each.

Whenever a question is answered incorrectly, the other members of the team are asked for another answer. If they are correct then 1 point is scored.

There are 5 rounds in the quiz and each team member must be chosen to answer in one of the rounds.

(a) What is the maximum score that a team can achieve in the quiz? [1]

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(b) In the first round of the quiz one team scored 14 points.

List the possible ways in which this number of points could have been scored. [2]

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(c) What is the highest score for one round that can be achieved in two different ways? State the two ways in which it is achieved. [2]

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11 Jill and Mimi both have devices which count the number of steps that they walk in a day.

On 1 January, Jill will walk 4000 steps. On each subsequent day she will walk 200 more steps than on the previous day.

Mimi will also count the number of steps that she walks in a day, but she will begin on 6 January by walking 3000 steps. On each subsequent day she will walk 500 more steps than on the previous day.

(a) (i) How many steps will Jill have walked in total before Mimi begins her walking? [1]

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(ii) On what date will Mimi first walk more steps in a day than Jill does? [1]

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Jill decides to change her routine in February. On 1 February she will walk 5000 steps. On 2 February she will walk 5000 steps and then a certain number of 'bonus' steps. On subsequent days she will walk the same total number of steps as on the previous day and then the same number of 'bonus' steps as she did on 2 February.

Jill walks 77 000 steps during the first ten days of February.

(b) What was the 'bonus' number of steps that she walked each day? [3]

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12 One reason that it is hard to proof-read documents is that it is easy to read what is expected rather than what is written. It has been found that many people can read scrambled text without any difficulty, so long as the first and the last letters of each word are correctly placed and all of the letters are included. It works in many languages. For example, Shakespeare's

A rose by any other name would smell as sweet

A rose by any ohter nmae would sleml as sewet

How many different ways are there to write this quotation with at least one such error? [3]

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13 In Round 1 of a competition, Jeremy wrote down the scores for 6 contestants, but he accidentally reversed the digits in one of them:

25, 36, 51, 24, 32, 12

The average (mean) of the scores should have been 24.

(a) Which score did Jeremy accidentally reverse? [2]

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In Round 2 of the competition, Jeremy wrote down the scores for the 6 contestants, but again he accidentally reversed the digits in one of them:

14, 25, 53, 32, 21, 17

The average (mean) of these numbers is a whole number, and the average (mean) of the correct scores should also have been a whole number.

(b) Which **two** scores might Jeremy have accidentally reversed? [1]

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In Round 3 of the competition, Jeremy wrote down the times (in seconds) for the 6 contestants, but this time he accidentally placed one of the decimal points in the wrong position in the number. He did not reverse any digits this time.

1.65, 24.7, 13.5, 2.51, 31.2, 15.3

The average (mean) of the times should have been 18.575 seconds.

(c) Which time has the decimal point in the wrong position in the number? [1]

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