Cambridge Assessment International Education

Cambridge International AS & A Level

CANDIDATE NAME

CENTRE NUMBER

CANDIDATE NUMBER

THINKING SKILLS **9694/11**

Paper 1 Problem Solving **May/June 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.

[Turn over

1 My usual train to work leaves at 08:16 and arrives at Alton railway station at 08:46.
I then catch a bus from Alton railway station, which leaves every 10 minutes from 08:00 onwards, and which takes 23 minutes to get to my office.

Today, my train arrived at Alton railway station 6 minutes late, but the buses ran on time.

How much later than usual did I arrive at work? [2]

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2 Reshma is starting a small business making and selling soap. She makes the soap in large 1 kg blocks and will sell them in either 100 g or 250 g pieces, cutting all the pieces across the block in the same direction.

It takes Reshma 10 seconds to accurately position the soap and make each cut and a further 30 seconds to wrap and box each cut piece.

(a) How long would it take Reshma to cut and wrap 1 kg of soap if she cuts it all into 250 g pieces? [1]

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(b) How much longer would it take to cut and wrap the 1 kg block if Reshma cut it into 100 g pieces instead of 250 g pieces? [1]

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3 A cinema has 200 seats.

The price of a ticket is $15 for a screening that begins at 18:00 or later and $9 for a screening that begins before 18:00.

This week's film has screenings that begin at 11:40, 13:55, 16:10, 18:25 and 20:40 each day.

(a) What is the maximum possible income from ticket sales for any day this week? [2]

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The manager of the cinema is sorting out next week's screening times. Next week's film has a running time of 125 minutes. He wants the last screening of the day to finish at 22:30 and each screening (except the first of the day) will begin 20 minutes after the end of the previous one. There will be four screenings each day.

(b) At what time each day next week will the first screening begin? [2]

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4 Hetty is programming a robotic cart to work in a warehouse. The warehouse is set up with bays on a square grid with pathways between them.

The cart starts facing North and is instructed to move to its target as follows:

three bays forward then turn left
three bays forward then turn left
one bay forward then turn right
two bays forward then turn left
one bay forward then turn right.

(a) What compass direction does the cart end up facing after following these instructions? [1]

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(b) Give a set of instructions that moves the cart from the original start point facing North to the same target using the fewest possible moves. [2]

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5 Ten children were asked to name the two colours of a local football team. The responses from the ten children are given below:

Red/Blue	Yellow/Blue	Purple/White	Green/Blue	Purple/Red
Green/Red	Blue/White	Red/White	Green/Red	White/Red

One child got both colours correct and another five children got one colour correct.

(a) What are the colours of the local football team? [1]

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The children were also asked when the football team was established. Their answers are given below.

1962	1959	1980	1995	2000
1972	1991	1981	1969	1977

No child got the correct answer, but six children were within 10 years of the correct answer.

(b) When was the football club established? [1]

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6 Milly runs a small business making clay models of animals. She works on Thursdays, Fridays, Saturdays and Sundays from 09:00 to 17:00 with a lunch break from 13:00 to 14:00. Her son Donny helps by making models on Saturdays and Sundays from 09:00 to 13:00. The times taken to make models of cats and giraffes are given in the table.

Animal	*Time taken per animal by Milly*	*Time taken per animal by Donny*
Cat	20 minutes	30 minutes
Giraffe	25 minutes	45 minutes

Last week, Milly and Donny made only cats.

(a) What is the total number of cats that they made last week? [2]

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On Saturday this week, Milly and Donny will make only cats. Each person will start making a new model at 09:00.

(b) Who will complete the 13th cat on Saturday, and at what time will it be complete? [2]

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Next week, Milly will make only giraffes. She will only start making a giraffe before lunch if she can complete it by 13:00 and she will only start making a giraffe after lunch if she can complete it by 17:00.

(c) What is the greatest number of giraffes that Milly can make in a day? [1]

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Milly realises that she could make an extra giraffe each day if she both reduces her lunch break to 55 minutes and starts lunch at a different time between 12:00 and 13:30.

(d) List all the possible times at which Milly could start her lunch break. [1]

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7 *Quinty* is a computer word game in which points are scored for creating five-letter words.

The five vowels, A, E, I, O and U, are always worth 1 point each. However, at the start of every new game the computer randomly gives each of the other letters of the alphabet a value between 2 and 8 inclusive.

In the game currently being played, the words created so far and their scores are:

PAINT	15 points
STONE	11 points
PLANT	19 points
CURRY	14 points
STAND	16 points

(a) What is the value of the letter L in this game? [1]

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(b) How many points would the word ADDED score in this game? [2]

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(c) What is the greatest value the letter R might have in this game? [2]

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8 Every Monday, Tamsin receives some pocket money from her parents, which she adds to her savings. The amount she receives is the same every week.

Every Monday, Caroline receives some pocket money from her parents, which she adds to her savings. Caroline receives three times as much pocket money each week as Tamsin.

After they had received their pocket money this Monday, Tamsin's savings were $30 more than Caroline's, but they will have exactly the same amount in their savings after another 5 weeks.

How much pocket money does Tamsin receive each week? [2]

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9 The computer game *Bolandian Escape* has 90 levels numbered 1 to 90. Levels 1 to 30 are classed as Easy, levels 31 to 60 are Medium and levels 61 to 90 are Hard. A player starts at level 1 and progresses through the levels in turn.

Each level has a time limit (in minutes) and a maximum number of attempts allowed. If a player runs out of time, they make another attempt at that level. If they fail at all the attempts, they still progress to the next level, but score no points.

Levels	*Maximum attempts per level*	*Time limit (minutes) for each attempt per level*	*Minimum possible completion time (minutes) per level*	*Points scored for successful completion per level*
1–30 (Easy)	10	15	5	4
31–60 (Medium)	20	25	8	6
61–90 (Hard)	40	45	12	9

(a) Show that a player who successfully completes every level of the game scores 570 points. [1]

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(b) What is the greatest amount of time that it could take to successfully complete every level of the game? [2]

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Rahim started playing the game on Monday and played for two hours each day, starting at 19:00. Each day, he was able to leave the game at the point he had reached at the end of the two hours and start from that same point on the following day. Rahim successfully completed every level of the game.

(c) What is the earliest day and time at which Rahim could have finished playing the game? [2]

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Jai played *Bolandian Escape*. He successfully completed 24 Easy levels, at least 11 Medium levels and at least 9 Hard levels. He scored a total of 285 points.

(d) What are the possible numbers of Medium and Hard levels that Jai could have completed? [3]

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10 *Yutu* is a pleasure boat that takes passengers for a 50-minute trip around Lake Bonneau during the summer months. There are 6 trips every day.

Trips start and finish at the landing stage. The first departure of the day is at 10:15, followed by departures at regular 90-minute intervals.

(a) At what time does the last trip of the day return to the landing stage? [2]

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The maximum number of passengers the boat is allowed to carry is 48.
There must be at least one adult for every two children.

Fares for each trip are as follows:

Adult	$12
Child	$7
Family	$40 (2 adults and up to 3 children)

(b) What is the smallest possible income from fares for any trip that has 48 passengers on board? [2]

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11 An astronaut is exploring a planet that has an unbreathable atmosphere.

On every trip, she does some walking and some running.
She never stops while she is outside the spaceship.
When walking, she consumes 1 litre of oxygen per minute.
When running, she consumes 2 litres of oxygen per minute.

Her walking speed is 2 km/hour and her running speed is 6 km/hour.
She must be back at her spaceship by the time there is no more oxygen left in her tank.

She leaves her spaceship at 09:16 with a tank containing 50 litres of oxygen.

(a) If she runs for 1 km, what is the latest time that she can arrive back at the spaceship? [2]

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(b) If she walks for only 0.4 km, what is the latest time that she can arrive back at the spaceship? [2]

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(c) What is the greatest distance she can run if she wants to return to the spaceship at exactly 10:00? [2]

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12 Jared visits a pizza shop and, whilst looking at the toppings available, he realises he could have a different combination of toppings every night for a week with just three toppings: Ham (H), Mushroom (M) and Tomato (T).

H, M, T, HM, HT, MT, HMT

What is the smallest number of toppings that would be needed for Jared to be able to have a different combination every night for a month of 31 days? [2]

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13 Some multiple-choice exam questions have three statements (labelled **i**, **ii** and **iii**), at least one of which is true. The candidate must select **one** answer from:

A only **i** is true
B only **ii** is true
C only **iii** is true
D **i** and **ii** are true (but **iii** is false)
E **ii** and **iii** are true (but **i** is false)

On average, the answers **A** to **E** are all equally likely.

(a) What is the chance that **ii** is true? [1]

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(b) What is the chance that **iii** is true? [1]

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It is not always necessary for the candidate to consider all three statements. For example, if the candidate considers statement **i** and finds that it is true, then they only need to consider statement **ii** to determine whether the answer is **A** or **D**.

(c) Give the other **two** examples where considering a second statement is certain to determine the answer. [2]

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