



Cambridge International AS & A Level

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THINKING SKILLS

9694/13

Paper 1 Problem Solving

May/June 2026

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. Do **not** use correction fluid or tape.
- 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 **20** pages. Any blank pages are indicated.

- 1 Saul is waiting in line to get lunch at a café. He can see that he is ninth from the front of the queue and fifteenth from the end of the queue.

Saul says that must mean there are 24 people in the queue as $9 + 15 = 24$.

- (a) Explain why Saul is **not** correct.

[1]

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After waiting for a while Saul can see two people ahead of him in the queue. When he turns around he notices his friend, Artie, in the queue. Saul can see three people between him and Artie. Artie turns round and says he can see eleven people behind him.

- (b) How many people are in the queue now?

[1]

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- 2 Joe is taking several items to a recycling centre. He is only allowed to take three bags of recycling at a time, each of which can hold up to 25 kg of recycling.

Joe has seven items of the following weights.

14 kg 12 kg 19 kg 3 kg 16 kg 7 kg 6 kg

What is the largest number of kilograms of recycling Joe could take in one trip?

[1]

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- 3 Tom, his brother and his sister have a total of \$50 to spend at a funfair.

The activities and prices at the funfair are shown in the table.

activity	price per person
Go-Karts	\$4.00
Haunted House	\$1.75
Miniature Golf	\$3.50
Big Wheel	\$2.00
Rollercoaster	\$3.25
Skydrop	\$3.00
Water Slide	\$3.25

- (a) What is the maximum number of different activities they could all do? [2]

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They decide that they all want to go on the Water Slide, Rollercoaster and Go-Karts. Tom's brother is too scared to go in the Haunted House.

- (b) State the two possible combinations of activities they could all do with the remaining money. [1]

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The funfair introduces a wrist band for \$15, which allows a visitor to do five activities once, and get a free drink and snack, usually costing \$4.25.

(c) What is the maximum discount on the normal purchase price that can be achieved? [1]

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- 4 In a long jump competition, each competitor has three attempts to jump as far as they can. Their score is the sum of the two longest distances that they achieve. The winner of the competition is the competitor with the highest score.

Last Saturday, eight people took part in the competition. The distances that they jumped were measured to the nearest centimetre. Most of the distances, in metres, are given in the following table, along with Dave's score. Each competitor had a different score.

competitor	first jump	second jump	third jump	score
Charles	7.82	7.64	7.41	
Dave	6.89	7.02	6.77	13.91
Eric	7.08	7.08	7.10	
Fred	6.94	7.21	7.42	
George	7.04	7.45	7.39	
Henry	7.55	7.54	7.42	
Ivan	7.21	7.27		
James	6.99	7.46	7.50	

Ivan came 5th in the competition.

- (a) What were the smallest and greatest possible lengths of Ivan's third jump? [3]

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The organiser of the competition noticed that if only the longest jump by each competitor had counted (so that their score was equal to their longest jump), then Ivan could have finished in a different position.

- (b) What is the highest position in which Ivan might have finished if the scoring had been changed in this way? [1]

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- 5 Jonny lives in Marn and his grandmother lives in Pato. When Jonny visits his grandmother, he gets a bus from Marn to the train station in Newn, then a train from Newn to the bus station in Ober, and finally a bus from Ober to Pato.

Buses leave Marn at 12 and 42 minutes past each hour.
The journey to Newn takes 25 minutes.

Trains leave Newn at 15, 35 and 55 minutes past each hour.
The journey to Ober takes 140 minutes.

Buses leave Ober at 5, 25 and 45 minutes past each hour.
The journey to Pato takes 10 minutes.

Today Jonny arrives at the bus stop in Marn at 11:30.

- (a) What is the earliest time that Jonny can arrive in Pato? [2]

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Next week Jonny will visit his grandmother and needs to arrive in Pato by 16:40 at the latest.

- (b) What is the time of the latest bus that Jonny could get at Marn? [2]

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- 6 'Femti' is a game for two players, in which the aim is to collect five numbered tiles that add up to exactly 50.

At the beginning of the game twenty tiles, each bearing a different number from 1 to 20, are placed in a bag. The two players take five tiles each from the bag and lay their tiles in front of them.

Now play alternates between them (unless either player already has tiles that add up to 50). At each turn the player whose turn it is takes one tile from the bag, then after laying the new tile in front of them they must put one of their other five tiles back into the bag to complete their turn.

The winner of the game is the first player whose five tiles add up to 50 at the end of their turn.

Elsa and Liam are playing a game of Femti. The tiles they have at present are:

Elsa: 4, 8, 10, 18 and 19

Liam: 1, 3, 9, 15 and 17

It is Elsa's turn.

- (a) (i) Explain why Elsa cannot win at this turn. [2]

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- (ii) List all the numbers currently in the bag that would allow Liam to win the game at his next turn. [1]

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At the beginning of their previous game, both Elsa and Liam took five tiles out of the bag that added up to 50, so there was no winner.

Elsa's five tiles were 2, 5, 10, 13 and 20; Liam's five tiles were all even numbers.

(b) What were the numbers on Liam's five tiles? [1]

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- 7 Jess and Tanya are playing a game. Each of them has a set of five cards, one with each of the numbers from 1 to 5 written on it. The game has five rounds.

In each round:

- The players each choose one of their cards and they then reveal the cards simultaneously.
- If both players chose cards with the same number, then the round is a draw.
- If one player chose a higher number then that player wins and scores the other player's number as their score.
- The cards played are then removed from the game.

The first three rounds of the game were as shown in the table.

round	1	2	3	4	5
Jess's card	4	2	5		
Tanya's card	1	3	2		

- (a) Show that Jess is currently ahead in the game with 3 points compared to Tanya's 2. [1]

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- (b) How many points will Tanya have once the game is finished? [2]

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The first two rounds of a second game are shown in the table below.

round	1	2	3	4	5
Jess's card	1	2			
Tanya's card	4	5			

(c) Explain why it is already impossible for Tanya to win this game.

[2]

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- 8 Stan owns a shop in which he sells and repairs bicycles. On any day, the number of bicycles that Stan sells is between 3 and 10 (inclusive). Each sale takes between 20 and 30 minutes. Each new bicycle sells for between \$100 and \$240 (inclusive).

Each bicycle repair takes between 40 and 80 minutes. For repairs, Stan charges a whole number of minutes at a rate of \$0.50 per minute.

Stan works for 9 hours each day. He does repairs whenever he is not selling bicycles. There are always plenty of bicycles waiting for repair. Stan will start a repair even if he does not have time to finish it on the same day.

- (a) What is the greatest number of bicycles that Stan could repair in a day? [2]

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- (b) What is the smallest amount of money that Stan could make **from repairs** in a day? [1]

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- (c) What is the greatest **total** amount of money that Stan could make in a day? [2]

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On Saturdays, Stan's son Oliver helps in the shop for 9 hours. Oliver does repairs but does not sell bicycles. He also takes between 40 and 80 minutes to do one repair. Stan charges \$0.40 per minute for a repair done by Oliver.

Last Saturday, both Stan and Oliver worked all day in the shop. The total amount made from repairs was \$406. Each of the bicycle sales took 20 minutes.

(d) How many bicycles did Stan sell last Saturday? [3]

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- 9 A bakery makes strawberry rolls in two sizes, small and large.
Small strawberry rolls are made 12 at a time, and large strawberry rolls are made 9 at a time.

12 small strawberry rolls require a total of 6 cups of fresh strawberries.
9 large strawberry rolls require a total of 4 cups of fresh strawberries.
Small strawberry rolls sell for \$3 each.
Large strawberry rolls sell for \$5 each.

- (a) If 36 cups of strawberries are used to make as many small strawberry rolls as possible, how much can these strawberry rolls be sold for in total? [1]

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- (b) What is the maximum number of strawberry rolls that can be made from 48 cups of strawberries? [1]

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A total of 46 cups of strawberries were used to make rolls that sold for a total of \$360.

- (c) How many strawberry rolls in total were made? [3]

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- 10 Clementine was born on her father's birthday.
This year her father is exactly four times her age.
In four years' time he will be exactly three times her age.

How old was Clementine's father on the day she was born?

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- 11 Sam is a robot window cleaner who works on a building with 12 floors.

The floors are numbered from 1 at the bottom to 12 at the top. Each floor contains 15 tall windows. It takes Sam 5 minutes to clean each window.

Once she has cleaned 50 windows, she returns to the ground to change her bucket of water. This takes her 1 minute, plus 1 minute for every floor above floor 1 that she has to travel down, plus 1 minute for every floor above floor 1 that she has to travel up.

- (a) Show that it would take Sam 16 minutes to leave floor 8 to change her bucket of water and return to floor 9 to continue cleaning windows. [1]

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Sam will clean all the windows on floor 1 first, then floor 2, and so on. She begins on floor 1 with a clean bucket of water and returns to floor 1 after cleaning the final window on floor 12.

Sam cleans each window starting at the bottom of the window and finishing at the top. So it does not take her any time to move up to the first window on the next floor after she finishes cleaning the last window of a floor. Because Sam is a robot, she does not need to take any breaks.

- (b) How long in total will it take Sam to clean all the windows and return to floor 1? [4]

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- 12 The local theatre has 100 seats. There are two different prices for booking a seat at a performance.

Economy seats cost \$30 each, and there are 60 of them.
Premium seats cost \$50 each, and there are 40 of them.

3 hours before a performance the prices of any unsold seats are reduced by 10%.

All of the seats were sold before the performance tonight and the total amount of money taken was \$3490.

What is the smallest number of seats that might have been sold at a reduced price? [3]

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- 13 Rachel was playing squash with Jane and Yvonne. They played from 09:00 to 10:00. At all times two people were playing squash while the third person watched.

Rachel and Jane played each other first. Then Rachel and Yvonne played each other. Finally, Jane and Yvonne played each other.

In total, Yvonne played for twice as long as Rachel and for 10 minutes longer than Jane.

At what times did the two changes of player take place?

[3]

[illegible]



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