CAMBRIDGE
International Education

Cambridge International AS & A Level

CANDIDATE NAME									
CENTRE NUMBER						CANDIDATE NUMBER				

0123456789

THINKING SKILLS **9694/01**

Paper 1 Problem Solving **For examination from 2028**

SPECIMEN PAPER **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.
  You may be awarded marks for correct steps towards a solution.
  In some questions, you must show your working to be awarded full marks.

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 In a geography class, the student who achieves the largest increase in their test score between any two consecutive weeks wins a prize.

	week 1	**week 2**	**week 3**	**week 4**	**week 5**
Sandra	95	93	60	77	63
Alex	92	89	62	54	59
Petro	51	52	86	86	60
Dominic	45	48	59	49	80
Hayley	98	90	56	65	92

(a) Which student wins the prize?

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..... [1]

(b) The students suggest changing the system so that the prize winner is the student who achieves the largest increase in their test score across **three** consecutive weeks (for example, the difference between week 2 and week 4).

Which student would win the prize using this system?

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..... [1]

2 Kareem hires a van for delivery jobs to various cities. The cost of hire is $90 per day plus the cost of the fuel he will use. The van can travel 6 km for each litre of fuel used. The fuel costs $1.20 per litre.

Kareem hires the van for three days for the following job:

- on Monday, Hondmarket to Targhill
- on Tuesday, Targhill to Kingburg
- on Wednesday, Kingburg to Hondmarket.

The table shows the distances in km between the cities.

Hondmarket			
153	Targhill		
212	245	Newton	
413	400	193	Kingburg

Kareem picks up the van in Hondmarket on Monday and returns the van in Hondmarket on Wednesday.

He is paid $600 for the job.

How much profit does he make?

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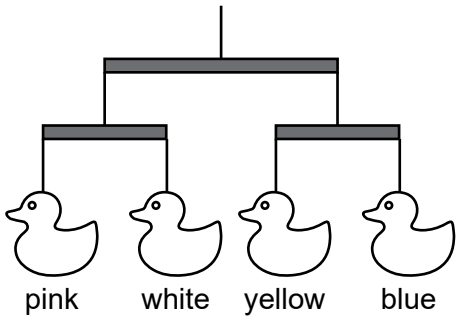
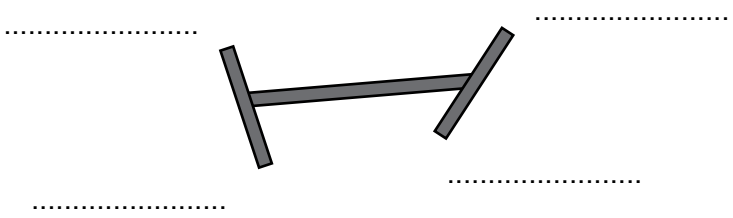
3 Baby Lara has a mobile over her cot. The mobile has four coloured ducks suspended by strings from wooden bars. The bars can rotate freely on the strings. The diagram shows a side view when all the ducks are in a line.



When Lara looked up, she saw the mobile from directly below.

(a) On the diagram, give an example of an arrangement of the colours that she would **not** see.



[1]

(b) How many arrangements of the four colours are possible with the bars as shown in **3(a)**?

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4 Nina sells cakes. Small cakes cost $3 each, medium cakes cost $5 each and large cakes cost $7 each.

Adam has $41 to buy 11 of Nina's cakes for his work colleagues. He will spend all the money.

(a) List all the possible combinations of cakes that Adam could buy.

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(b) Shanti intends to spend $120 on cakes from Nina. She will buy twice as many small cakes as large cakes.

How many medium cakes will Shanti buy?

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5 A theatre has 40 rows of seats with 30 seats in each row. The seats in each row are numbered consecutively. There is a central aisle between seats 15 and 16 of each row.

The ticket prices at the theatre are:

rows 1–10 $55 each
rows 11–40 $35 each

When tickets for two seats next to each other in the same row and on the same side of the central aisle are bought together, there is a discount of $10 on the total price.

All tickets for the opening night's performance have been sold.

What is the smallest possible total income from ticket sales for the opening night's performance?

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6 Twelve teams will compete in a football tournament at a stadium. The twelve teams are arranged into four groups with three teams in each group. In each of the four groups, each team will play the other members of the group once.

In the first semifinal, the winning team of the first group will play the winning team of the second group.
In the second semifinal, the winning team of the third group will play the winning team of the fourth group.
The winning teams of these two matches will play in the final.

Each match will last for 20 minutes. If the score is the same for each team at the end of 20 minutes, the teams will play for an extra 10 minutes. If the scores are then still the same, the winning team will be decided by the toss of a coin.

The matches will be played one at a time in the order: first group matches, second group matches, third group matches, fourth group matches, semifinals, final. There will be a 15-minute break between each match. The tournament will start at 09:00.

(a) What is the earliest time that the tournament could end?

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(b) Jamal is a member of one of the teams in the tournament. He will play in all their matches.

(i) What is the greatest length of time that Jamal could need to be at the stadium?

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(ii) What is the latest time that Jamal's first match could start?

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7 A computer has a fault. It performs calculations correctly, but, when it displays the calculation, every digit displayed is either one higher or one lower than the correct digit.

The computer display showed a complete calculation as:

34 + 58 = 63

This could result from three possible correct calculations.

(a) What are the **three** possible correct complete calculations?

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(b) On the next day, the computer display showed a complete calculation as:

67 × 8 = 413

This could result from two possible correct calculations.

What are the **two** possible correct complete calculations?

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8 Shopping is delivered to my house every week in plastic carrier bags. During each delivery, I can return bags from past deliveries. The maximum number of bags that I can return each week is either the number used for the previous week's delivery, or 25 bags, whichever is smaller. I receive 5 cents for every bag I return, and each week I return the maximum number of bags permitted.

The table shows the number of bags used to deliver my shopping each week. I could not return any bags in week 1, as I did not have any past deliveries.

week	number of bags
1	17
2	20
3	12
4	27
5	10
6	41
7	16

(a) How many bags do I have at home after the week 3 delivery?

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(b) How many bags do I have at home after the week 7 delivery?

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(c) How much money have I received in total so far for all the returned bags?

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9 In a game, each of the first seven letters of the alphabet, A, B, C, D, E, F, G, is paired with a number from 1 to 7, in some order. Each letter is paired with a different number.

Players then form words from these letters. The score for each word is the sum of the numbers that are paired with the letters in the word.

In one game, the word FEE scores 19, the word ACE scores 16 and the word CAB scores 10.

(a) (i) Explain how it can be deduced that F must be paired with 5.

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(ii) What are the possible scores for the word CAD?

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(b) The remaining letters of the alphabet are also paired with numbers as follows:

- H I J K L M are paired with the numbers 8 to 13, in some order
- N O P Q R S T are paired with the numbers 14 to 20, in some order
- U V W X Y Z are paired with the numbers 21 to 26, in some order

What is the least possible score for the word ACUTELY?

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(c) The word FOOT scores 56 and the word TOFFEE scores 57.

Which number is T paired with?

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10 A 180 g bag of sweets contains a combination of red sweets and orange sweets. The total weight of sweets in a bag is always at least 178 g and never more than 182 g. Each red sweet weighs 11 g and each orange sweet weighs 8 g. The total number of sweets in a bag is always 19 or 20.

The bag of sweets I bought last week contained 7 red sweets and 13 orange sweets.

(a) What are the other **three** combinations of red sweets and orange sweets that a bag of sweets may contain?

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(b) The makers of the sweets now intend to add yellow sweets, weighing 9 g each, to the combination of red and orange sweets. The weight of a red sweet and an orange sweet will **not** change and the total weight of sweets in a bag will still be between 178 g and 182 g. The total number of sweets in a bag will still be 19 or 20. There will be at least 5 of each type of sweet in every bag.

Find a combination of red, orange and yellow sweets that will result in a different number of each type in a bag.

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11 Peter, Kirsty and Ling all have some books.
Peter gives 2 of his books to Kirsty, and Kirsty gives 3 of her books to Ling.
Ling now has 8 more books than Peter and 1 more book than Kirsty.
Everyone has at least 1 book.

(a) What is the smallest total number of books there could be?

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(b) There are at most 100 books in total.

What is the largest number of books that Kirsty could have?

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12 Zayn is driving from Burada to Orada. After driving for 3 hours, he has stopped for a rest. He has 126 km further to drive.

He travelled 34 fewer kilometres during the second hour than during the first hour because of heavy traffic. He was 41 km short of halfway through his journey at the end of the second hour.

During the third hour he travelled 88 km.

How far did Zayn travel during the second hour of his journey?

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