



Cambridge International AS & A Level

CANDIDATE
NAME

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CENTRE
NUMBER

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THINKING SKILLS

9694/11

Paper 1 Problem Solving

May/June 2020

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 most questions, full marks will be awarded for a correct answer without any working. In some questions, however, you will not be awarded full marks if working needed to support an answer is not shown.

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. Blank pages are indicated.

In February, the last available ticket was sold on the Wednesday.

(b) (i) What was the greatest possible income from the ticket sales? [1]

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(ii) What was the least possible income from the ticket sales? [1]

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In March, all tickets were sold by the end of the Thursday. Each day the number of tickets sold was 40 fewer than the previous day.

(c) How many tickets were sold on the Thursday? [2]

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- 3 There are ten teams in the Rodentian Football League. During each season every team plays two matches against each of the other teams; once at home and once away from home.

Points are awarded as follows:

Win away from home	4 points
Win at home	3 points
Draw away from home	2 points
Draw at home	1 point
Loss	0 points

Two days ago the league table was as shown below.

Team	Played	Won	Drawn	Lost	Goals scored		Points
					For	Against	
Squirrels	9	6	2	1	18	10	24
Jerboas	9	5	3	1	21	11	22
Porcupines	9	5	2	2	17	10	22
Agoutis	9	6	0	3	19	16	20
Marmots	9	3	4	2	19	13	17
Lemmings	9	4	1	4	16	12	15
Beavers	9	2	3	4	14	17	12
Coypus	9	3	1	5	13	19	11
Hamsters	9	0	4	5	11	22	8
Gophers	9	0	2	7	6	24	3

Three matches were played yesterday afternoon and this is the updated table.

Team	Played	Won	Drawn	Lost	Goals scored		Points
					For	Against	
Porcupines	10	6	2	2	19	11	25
Squirrels	9	6	2	1	18	10	24
Jerboas	10	5	3	2	22	14	22
Agoutis	9	6	0	3	19	16	20
Marmots	9	3	4	2	19	13	17
Beavers	10	3	3	4	17	18	16
Lemmings	10	4	1	5	17	14	15
Coypus	10	3	2	5	14	20	12
Hamsters	9	0	4	5	11	22	8
Gophers	10	0	3	7	7	25	5

- 4 Bill and Mary Jones will be staying in a hotel in Townsville on Friday night. The prices and facilities at the four hotels in Townsville are shown in the following table.

Hotel	Single room, per night		Double room, per night		Gym	Sauna	Wi-Fi
	Room only	Breakfast included	Room only	Breakfast included			
Plaza	\$140	\$150	\$190	\$210	Yes	Yes	Yes
Village	\$90	\$100	\$155	\$160	Yes	No	No
Garden	\$150	\$165	\$195	\$205	Yes	No	Yes
Coral	\$120	\$125	\$175	\$195	No	Yes	Yes

Bill and Mary want a double room, with breakfast included. They do not mind whether or not there is a gym or sauna, but do want Wi-Fi.

- (a) Which hotel should Bill and Mary choose in order to pay the least possible for their stay? [1]

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Bill and Mary’s son Euan has decided to come with them to Townsville. Euan must stay in the same hotel as his parents. He wants a single room, a gym and Wi-Fi, but does not want breakfast. The Joneses will choose the cheapest hotel that meets all of their requirements.

- (b) What is the least possible that the Jones family will now have to pay for their holiday? [2]

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- 6 When I arrived at Barnoff railway station yesterday evening I noticed that the clocks on platforms 1 and 2 were displaying different times, as follows:



A few seconds later they both changed, simultaneously, to:



After watching them both for several minutes, I concluded that the last digit of the platform 2 clock was faulty, with one element that was permanently on and one element that was permanently off.

For how many minutes altogether during each hour are the displays on both of these clocks identical? [3]

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7 The following table gives the cost of tickets for entry into the Penguin Theme Park.

<i>Type of ticket</i>	<i>Cost</i>
Adult	\$40
Child	\$25
Family (2 adults and 2 children)	\$120
Group (up to 10 people)	\$350

Tickets can only be used on the day on which they are bought. Every child must be accompanied by an adult; each adult can only be responsible for one child. Last Saturday, the total money taken in ticket sales was \$18 000.

(a) What was the least possible number of people that entered the park last Saturday? [1]

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(b) What was the greatest possible number of people that entered the park last Saturday? [2]

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Last Monday, 279 adults and 160 children visited the park.

(c) What was the least possible amount that was taken in ticket sales last Monday? [3]

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8 I am on holiday in Dolbania. Five different denominations of coin are in circulation here. I know they are worth 5¢, 10¢, 25¢, 50¢ and \$1, but I don't know which is which and the values are not marked on them. One of the coins has a star on it, one has a tree, one has a cat, one has a bird and one has a fish.

I visit the same cafe every morning. Normally I buy a cup of coffee and a slice of carrot cake. The cost is \$3.20 and I pay with a \$5 note. On the first morning I received 3 'fish' coins and 3 'cat' coins as change; on the second morning my change was 5 'fish' coins, 5 'bird' coins and 1 'star' coin.

(a) What is the value of the 'cat' coin? [2]

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Today I had my usual cup of coffee but I ordered two slices of carrot cake. Once again I paid with a \$5 note, and this time my change was a single 'cat' coin.

(b) How much does my cup of coffee cost? [1]

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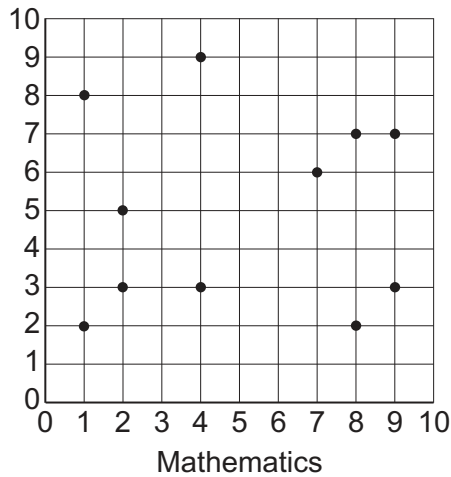
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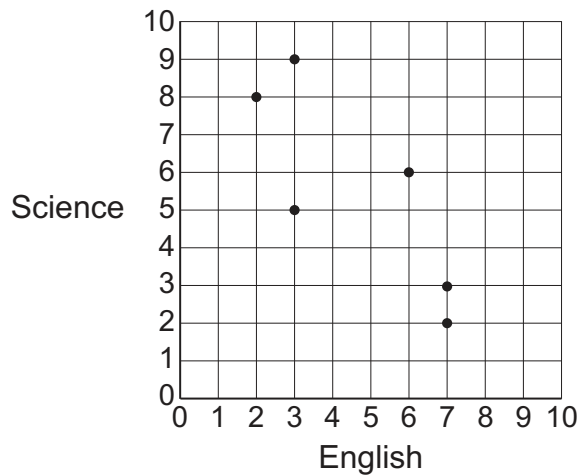
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- 9 Six students sat tests in Mathematics, English and Science. Their scores in English and Science were plotted against their scores for Mathematics in a scatterplot. By mistake, the dots do not distinguish between the English and Science scores. However, each dot is plotted correctly, and no students were absent for any test.



The scatterplot showing just English and Science scores is shown below.



- (a) How many students obtained a higher score in Mathematics than they did in English? State the scores in these two subjects for each of these students. [3]

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- (b) Explain why there are only 11 dots rather than 12 dots in the first scatterplot. [1]

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10 Dave can drive from Abdet to Bentall by two routes. The old route goes in roughly a straight line while the new faster route is 26% longer. Dave's average speed on the new faster route is 40% higher than his average speed on the old route.

(a) By what percentage is Dave's journey time reduced by taking the new route compared to the old? [2]

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This time saving is actually 6 minutes and Dave's average speed on the new route is 70 km per hour.

(b) How many kilometres longer is the new route than the old route? [3]

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(d) (i) Who makes the 60th frame to be completed? [2]

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(ii) How many hours has she been working when the 60th frame is completed and how many frames has she made? [2]

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