



M2

**GENERAL CERTIFICATE OF SECONDARY EDUCATION
MATHEMATICS C (GRADUATED ASSESSMENT)
MODULE M2 – SECTION B**

B272B



Candidates answer on the question paper.

OCR supplied materials:
None

Other materials required:

- Geometrical instruments
- Tracing paper (optional)
- Electronic calculator

**Tuesday 1 March 2011
Morning**

Duration: 30 minutes



Candidate forename		Candidate surname	
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Centre number						Candidate number				
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MODIFIED LANGUAGE

INSTRUCTIONS TO CANDIDATES

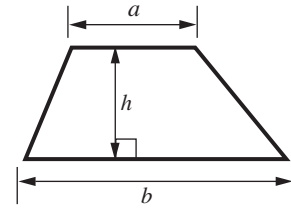
- Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Write your answer to each question in the space provided. Additional paper may be used if necessary but you must clearly show your candidate number, centre number and question number(s).
- Show your working. Marks may be given for a correct method even if the answer is incorrect.
- Answer **all** the questions.
- Do **not** write in the bar codes.

INFORMATION FOR CANDIDATES

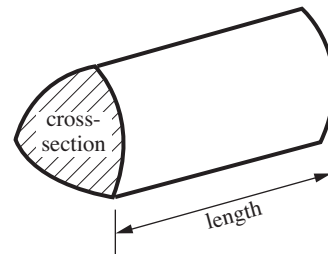
- The number of marks is given in brackets [] at the end of each question or part question.
- Section B starts with question 5.
- You are expected to use a calculator in Section B of this paper.
- The total number of marks for this Section is **25**.
- This document consists of **12** pages. Any blank pages are indicated.

Formulae Sheet

Area of trapezium = $\frac{1}{2}(a + b)h$



Volume of prism = (area of cross-section) \times length



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5 These are the average monthly temperatures at the North Pole and the South Pole.



The North Pole												
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Temp (°C)	-31	-32	-31	-23	-11	-1	1	0	-9	-20	-27	-28

The South Pole												
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Temp (°C)	-32	-44	-60	-65	-66	-65	-67	-68	-66	-57	-43	-32

(a) Complete these sentences.

In June the temperature at the South Pole is °C. [1]

In August the temperature at the South Pole is °C colder than at the North Pole. [1]

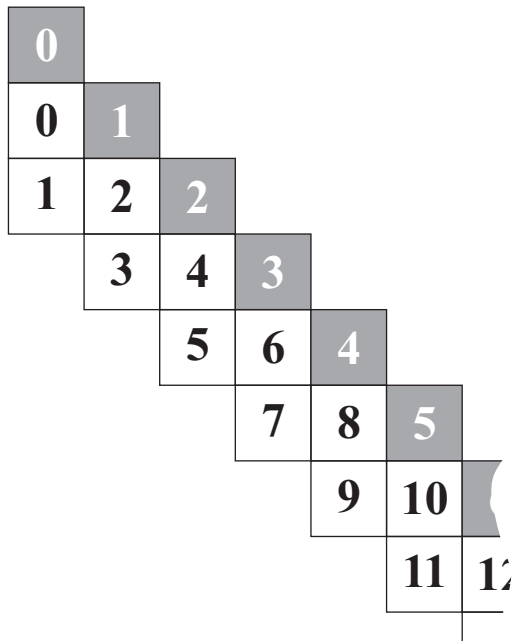
(b) Which is colder, the North Pole or the South Pole?

The Pole because

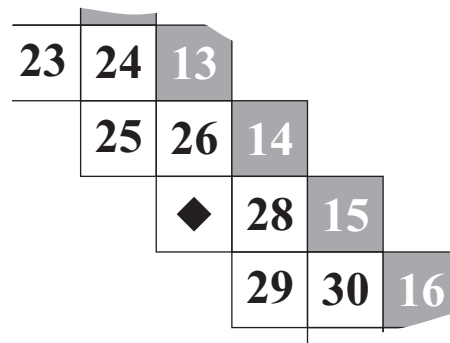
.....

..... [2]

6 Look at this number pattern.

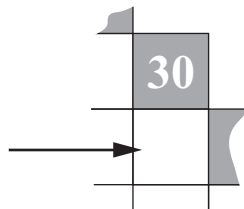


(a) Work out what number ◆ should be.



(a) ◆ = [1]

(b) What number goes in this box?
Explain how you worked it out.



..... goes in this box because

.....

..... [2]

7 Lucy wants to go on a hot air balloon flight.

- (a) A local balloon company used to charge £80 a flight.
This cost has increased by 25%.

How much **more** does it now cost?

(a) £ [1]

- (b) (i) Lucy enters a local radio competition.
About 1000 people take part in this competition.
The name of the winner is picked at random.
Just before she enters, Lucy's friend Liam says

It is impossible to win.

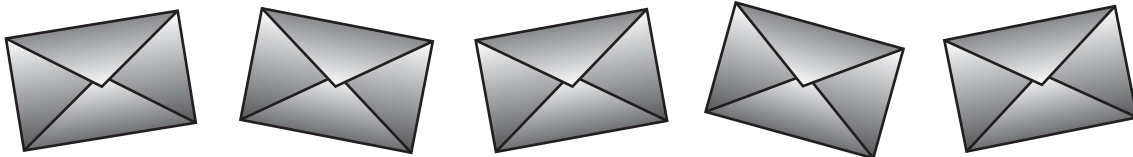
Liam is wrong.

What should he have said?

.....
..... [1]



- (ii) Lucy is lucky and wins.
She picks one of these identical closed envelopes to see her prize.
One has a balloon flight ticket in it.



Mark arrows on the line to show these probabilities.

* Lucy picks the envelope with the balloon flight ticket in it.
Label this arrow W.

* Lucy **does not** pick the envelope with the balloon flight ticket in it.
Label this arrow L.



[2]

Lucy wins the balloon flight!
She finds out some information about balloon flights.

- (c) The temperature falls as a balloon rises.
Lucy finds this formula on the Internet.

$$\text{Temperature fall in degrees C} = \text{rise in height in metres} \div 200$$

- (i) A hot air balloon rises by 1000 m.

Use the formula to calculate the temperature fall.

(c)(i) °C [1]

- (ii) In 2002 Curtis Rivers bungee-jumped from a height of 5000 m from a hot air balloon.
The temperature on the ground was 26 °C.

Use the formula to find the temperature at 5000 m.

(ii) °C [2]

- (d) Hot air balloons float with the wind.

Lucy finds out how far the last few flights went.
These are the distances in kilometres.

16 12 12 8 17 18 15

What is the median distance?

(d) km [2]

- (e) Lucy looks on the balloon company's website.



- (i) The width of this balloon's basket is 3 m.

Estimate the width of the balloon.

(e)(i) m [1]

(ii)

Our balloons are made of special lightweight nylon.
100 square metres weighs only 4400g.

How much is 4400 g in kilograms?

(ii) kg [1]

(iii)

Our balloons can carry 12 passengers.
Youngsters are welcome!

A quarter of the passengers on a flight are youngsters.

What percentage of the passengers are youngsters?

(iii) % [1]

- (f) The balloon company will pick Lucy up at Bristol Temple Meads station. Her nearest station to home is Birmingham International. She looks at the train timetable.

1. Journey Planner > 2. Timetable Results > 3. Fares & Availability > 4. Purchase Tickets					
Log in / Register					
Birmingham International to Bristol Temple Meads					
		← Earlier		Outward Journey	
				Later →	
<u>Journey Number</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>
<u>Departs</u>	08:09	08:37	09:04	09:37	10:05
<u>Arrives</u>	10:11	10:41	11:11	11:41	12:11
<u>Duration</u>	2:02	2:04	2:07	2:04	2:06
<u>Changes</u>	1	1	1	1	1

- (i) Lucy is being met at Bristol Temple Meads at 11 o'clock.

Mark on the timetable the train she should catch from Birmingham International.

[1]

- (ii) Lucy writes down the return train times for the early evening.

Leave Bristol Temple Meads	4:30	5:00	6:00	6:30
Arrive Birmingham International	6:26	7:28	7:54	8:29

She decides to catch the 6:00 train.

What time does she arrive at Birmingham International?

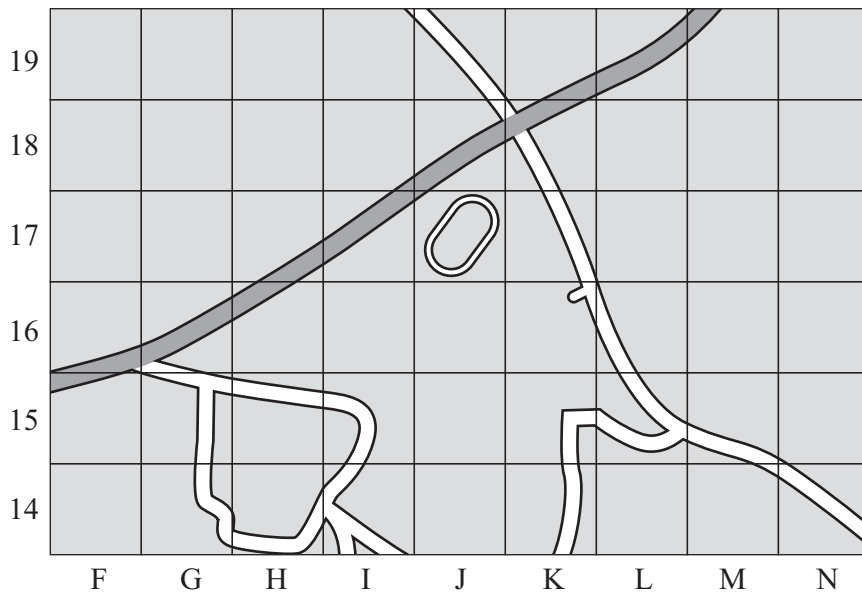
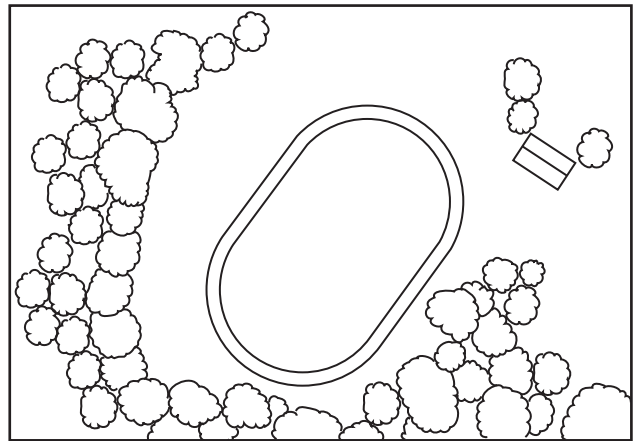
(f)(ii) [1]

- (g) There are 38 passengers waiting for balloon rides.
Each balloon holds 12 passengers.

How many balloons are needed in total?

(g)..... [2]

- (h) It is time to land.
The pilot wants to land near the running track shown on the map below.
The pilot needs to radio to the van to be picked up.



- (i) Write down the grid reference for the running track.

(h)(i) [1]

- (ii) A sudden gust of wind blows the balloon into square L17.
Mark this square with a cross.

[1]

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