| Candidate forename | | Candidate surname | |
|---|---|---|---|

| Centre number | | | | | | Candidate number | | | | |
|---|---|---|---|---|---|---|---|---|---|---|

# OXFORD CAMBRIDGE AND RSA EXAMINATIONS
## GENERAL CERTIFICATE OF SECONDARY EDUCATION

# B272B

# MATHEMATICS C

# (GRADUATED ASSESSMENT)

## MODULE M2 (SECTION B)

## TUESDAY 1 MARCH 2011: Morning
## DURATION: 30 minutes

## SUITABLE FOR VISUALLY IMPAIRED CANDIDATES

**Candidates answer on the question paper.**

**OCR SUPPLIED MATERIALS:**

**None**

**OTHER MATERIALS REQUIRED:**

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

**READ INSTRUCTIONS OVERLEAF**

DC (LEO/CGW) 11MEP03002 43037
© OCR 2011 [100/6437/0]

## INSTRUCTIONS TO CANDIDATES

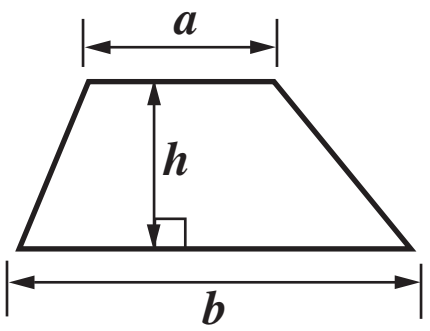
- **Write your name, centre number and candidate number in the boxes on the first page. Please write clearly and in capital letters.**
- **Use black ink. Pencil may be used for graphs and diagrams only.**
- **Read each question carefully. Make sure you know what you have to do before starting your answer.**
- **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.**

## INFORMATION FOR CANDIDATES

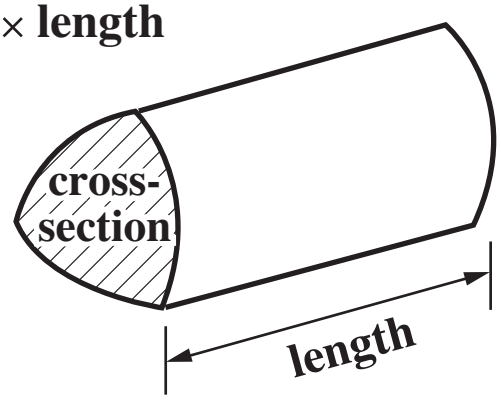
- **The number of marks is given in brackets [ ] at the end of each question or part question.**
- **Section B starts with question 5.**
- **You are expected to use a calculator in Section B of this paper.**
- **The total number of marks for this Section is 25.**

# FORMULAE SHEET

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




**Volume of prism = (area of cross-section) × length**



**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 mark]**

**In August the temperature at the South Pole**

**is _____ °C colder than at the North Pole. [1 mark]**

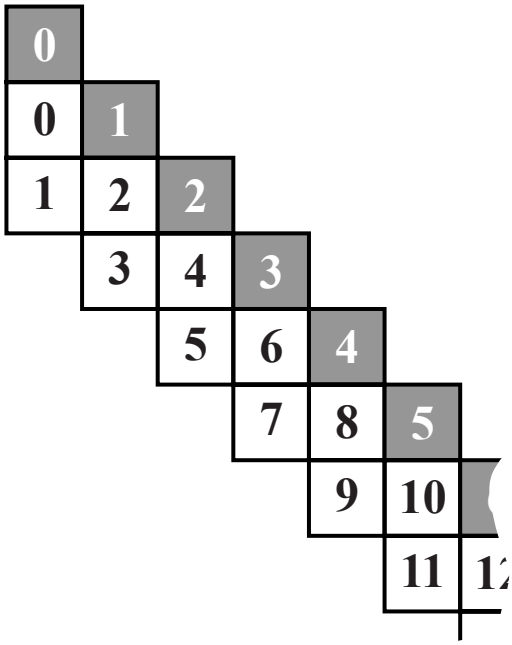
**(b) Which is colder, the North Pole or the South Pole? [2 marks]**

**The _____ Pole because _____**

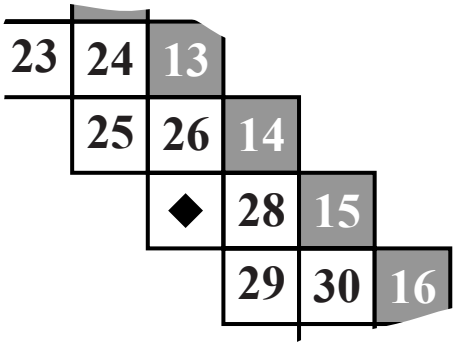
_____

_____

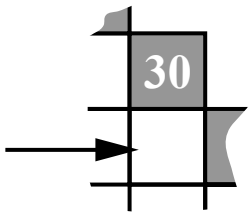
**6 This number pattern continues.**




**(a) Work out what number ◆ should be. [1 mark]**




**(a) ◆ = _____**




**(b) What number goes in this box?**
**Explain how you worked it out.**
**[2 marks]**

**_____ goes in this box because _____**

_____

_____

**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%.**

**By how much has the cost increased? [1 mark]**

**(a) £ _____**

**(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 mark]**

_____

_____

**(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 marks]**

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

**(c) As a balloon rises the temperature falls.**
**Lucy finds this formula on the Internet.**

| **Temperature fall in degrees C = rise in height in metres ÷ 200** |
|---|

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

**Use the formula to calculate the temperature fall.**
**[1 mark]**

**(c)(i) _____ °C**

**(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.**
**[2 marks]**

**(ii) _____ °C**

**(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? [2 marks]**

**(d) _____ km**

**(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. [1 mark]**

**(e)(i) _____ m**

**(ii)**

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

**How much is 4400 g in kilograms? [1 mark]**

**(ii) _____ kg**

(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? [1 mark]**

**(iii) _____ %**

**(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.**

| Birmingham International to Bristol Temple Meads | | | | | |
|---|---|---|---|---|---|
| Journey Number | 1 | 2 | 3 | 4 | 5 |
| Departs | 08.09 | 08.37 | 09.04 | 09.37 | 10.05 |
| Arrives | 10.11 | 10.41 | 11.11 | 11.41 | 12.11 |

**(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 mark]**

**(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? [1 mark]**

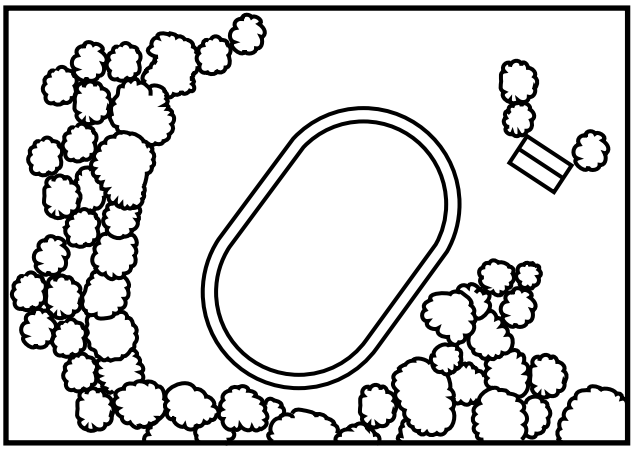
**(f)(ii) _____**

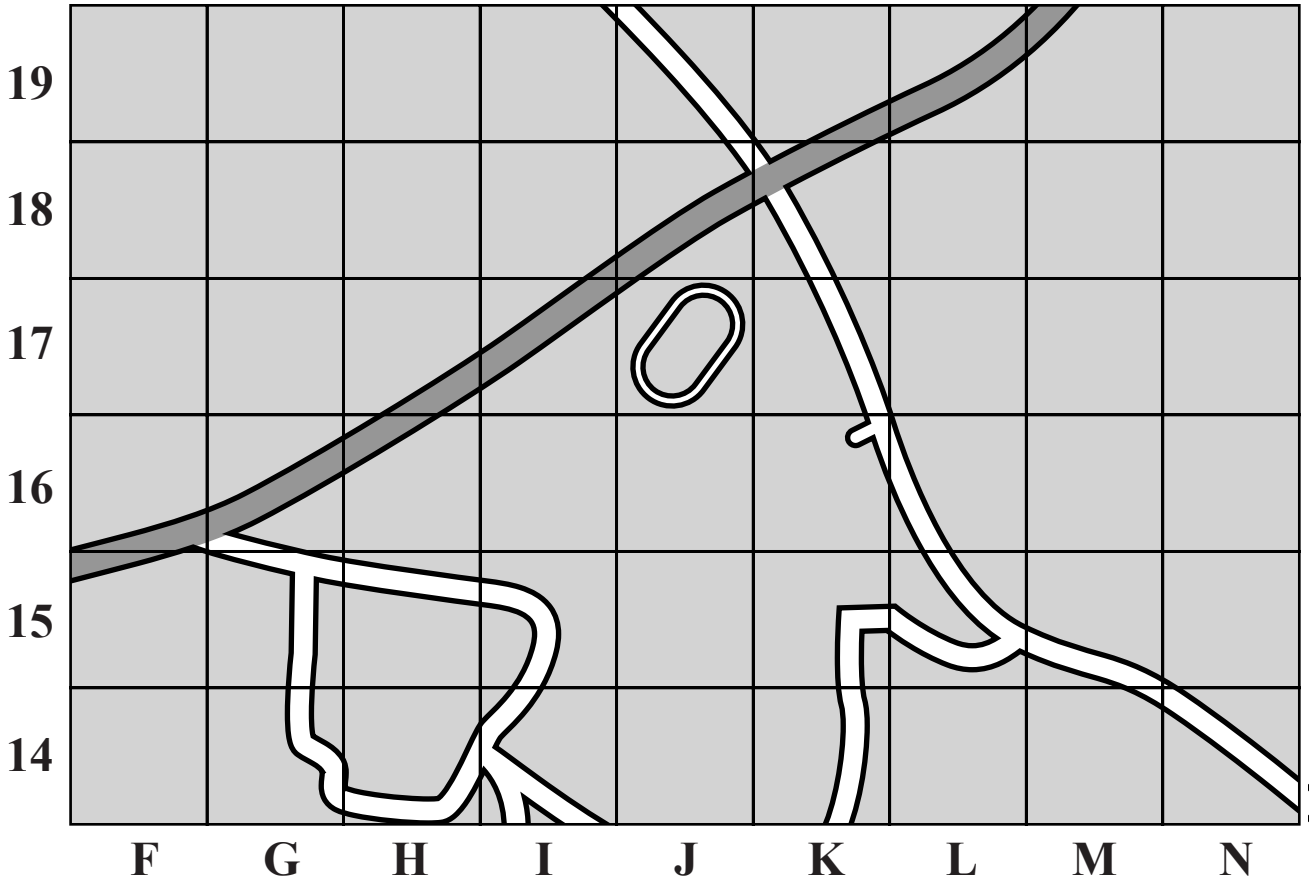
**(g) There are 38 passengers waiting for balloon rides. Each balloon holds 12 passengers.**

**How many balloons are needed in total? [2 marks]**

**(g) _____**

**(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. [1 mark]**

**(h)(i) _____**

**(ii) A sudden gust of wind blows the balloon into square L17.**
**Mark this square with a cross. [1 mark]**

OCR
RECOGNISING ACHIEVEMENT

**Copyright Information**

**OCR is committed to seeking permission to reproduce all third-party content that it uses in its assessment materials. OCR has attempted to identify and contact all copyright holders whose work is used in this paper. To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced in the OCR Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download from our public website (www.ocr.org.uk) after the live examination series.**

**If OCR has unwittingly failed to correctly acknowledge or clear any third-party content in this assessment material, OCR will be happy to correct its mistake at the earliest possible opportunity.**

**For queries or further information please contact the Copyright Team, First Floor, 9 Hills Road, Cambridge CB2 1GE.**

**OCR is part of the Cambridge Assessment Group; Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.**