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M8

Monday 16 January 2012 – Morning

GCSE MATHEMATICS C (GRADUATED ASSESSMENT)

B278B MODULE M8 – SECTION B

B21656O112

Candidates answer on the Question Paper.

OCR supplied materials:
None

Other materials required:
- Geometrical instruments
- Tracing paper (optional)
- Scientific or graphical calculator

Duration: 30 minutes

B278B

Candidate forename		Candidate surname	

Centre number						Candidate number				

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. HB pencil may be used for graphs and diagrams only.
- Answer **all** the questions.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Show your working. Marks may be given for a correct method even if the answer is incorrect.
- 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).
- Do **not** write in the bar codes.

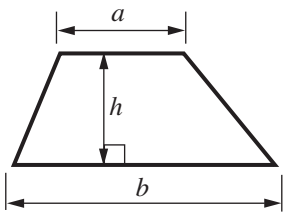
INFORMATION FOR CANDIDATES

- The number of marks is given in brackets **[ ]** at the end of each question or part question.
- Section B starts with question 6.
- You are expected to use a calculator in Section B of this paper.
- Use the π button on your calculator or take π to be 3·142 unless the question says otherwise.
- The total number of marks for this Section is **25**.
- This document consists of **8** pages. Any blank pages are indicated.

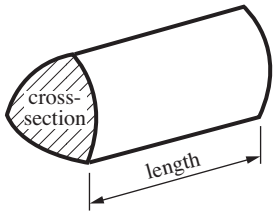
This paper has been pre modified for carrier language

Formulae Sheet

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



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

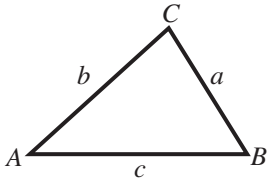


In any triangle ABC

Sine rule $\dfrac{a}{\sin A} = \dfrac{b}{\sin B} = \dfrac{c}{\sin C}$

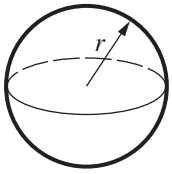
Cosine rule $a^2 = b^2 + c^2 - 2bc\cos A$

Area of triangle = $\frac{1}{2}ab\sin C$



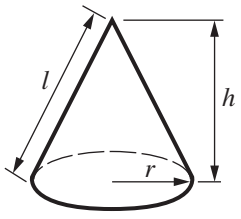
Volume of sphere = $\frac{4}{3}\pi r^3$

Surface area of sphere = $4\pi r^2$



Volume of cone = $\frac{1}{3}\pi r^2 h$

Curved surface area of cone = $\pi r l$



The Quadratic Equation

The solutions of $ax^2 + bx + c = 0$, where $a \neq 0$, are given by

$$x = \frac{-b \pm \sqrt{(b^2 - 4ac)}}{2a}$$

PLEASE DO NOT WRITE ON THIS PAGE

6 **(a)** Solve.

$4x > 10 - x$

(a) ..... **[2]**

(b) Solve algebraically these simultaneous equations.

$2x + 3y = 6$
$5x - 2y = 34$

(b) $x =$ .....

$y =$ ..... **[4]**

7 In the following expressions, a, b and c represent lengths.

A πab^2 **B** $3a + 3b + 3c$ **C** $\frac{1}{2}(c + b)a$ **D** $2\pi b^3 (a + c)$

Which of these expressions, **A**, **B**, **C** or **D**, could represent

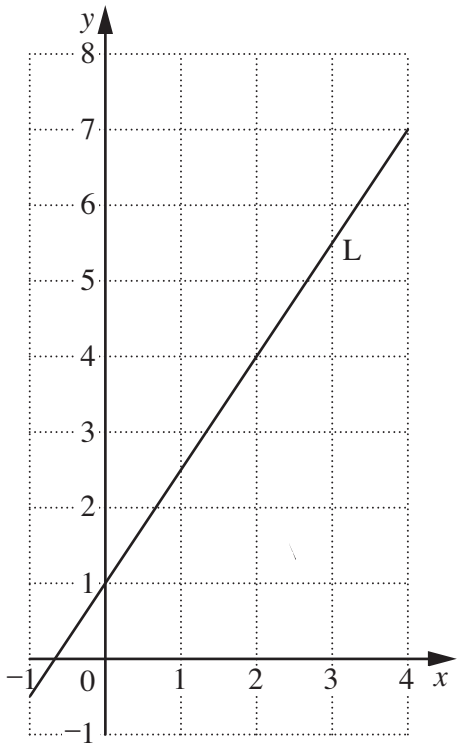
(a) an area,

(a) ..... **[1]**

(b) a volume?

(b) ..... **[1]**

8 Find the gradient of line L.



..... **[2]**

9 A population of penguins is increasing by 6% each year.
The population in December 2008 was 4800.

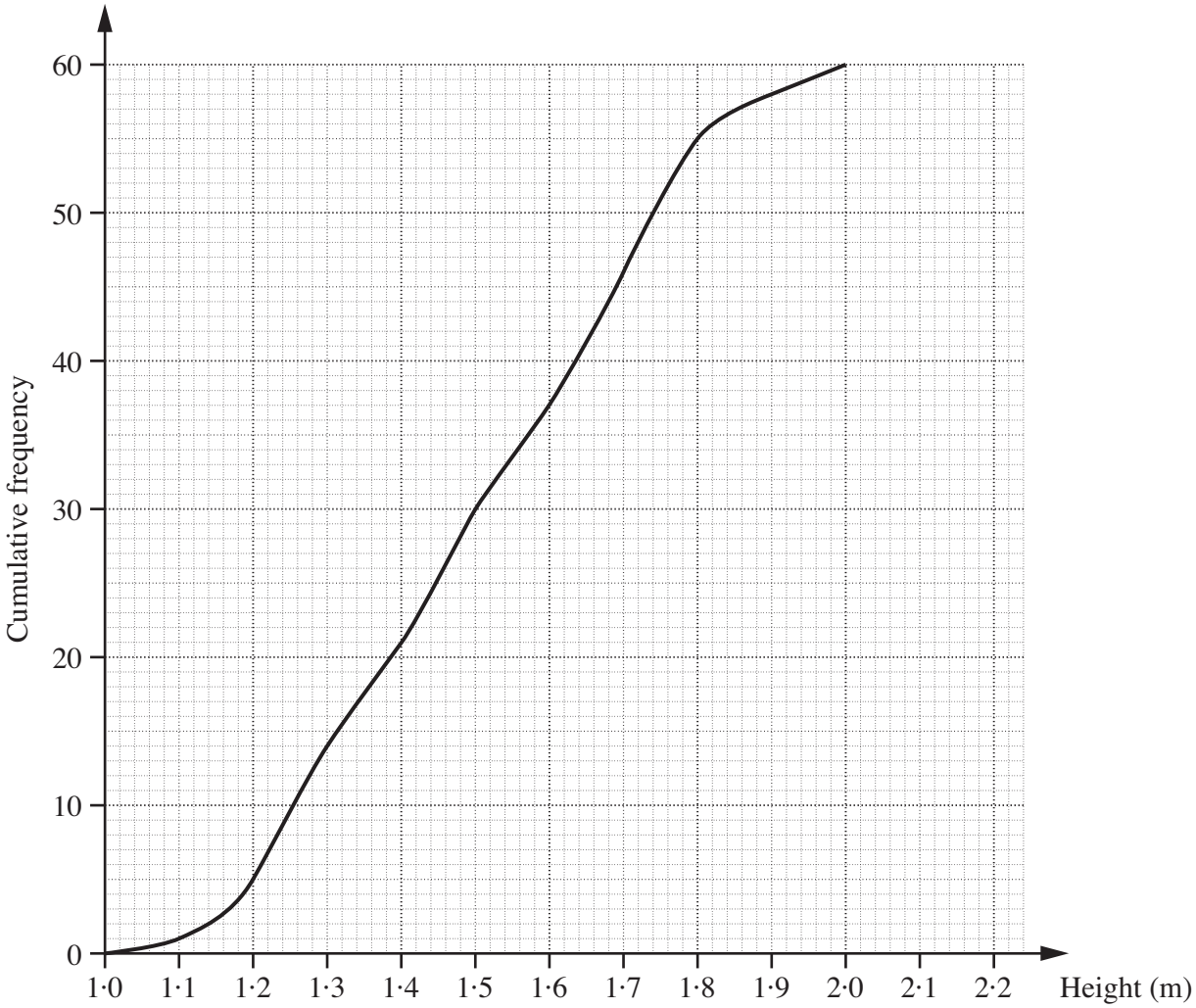
(a) Calculate the population in December 2011.

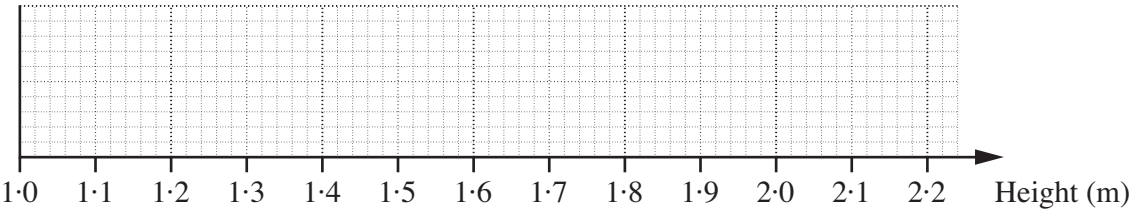
(a) ..... **[3]**

(b) Calculate the population in December 2007.

(b) ..... **[3]**

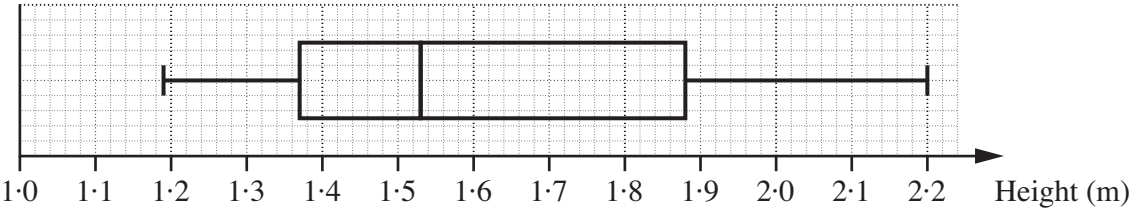
10 This cumulative frequency graph represents the heights of the high tides one month in Cape Town, on the west coast of South Africa.





(a) On the grid above, construct a box plot to represent this distribution. **[3]**

(b) This box plot represents the heights of the high tides the same month in Knysna, on the south coast of South Africa.



(i) Sizwe says:

> The high tides in Knysna were higher on average than those in Cape Town.

Is Sizwe correct? Give a reason for your answer.

..... because .....

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

(ii) Noor says:

> The heights of the high tides in Knysna were more variable than those in Cape Town.

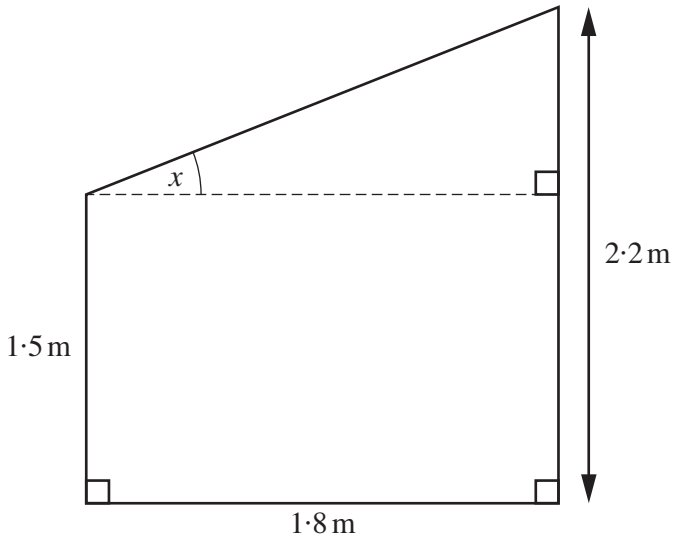
Is Noor correct? Give a reason for your answer.

..... because .....

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

TURN OVER FOR QUESTION 11

11 The diagram shows the cross-section of a shelter.



Not to scale

Calculate x, the angle that the roof of the shelter makes with the horizontal.

..... ° **[4]**