

GENERAL CERTIFICATE OF SECONDARY EDUCATION
MATHEMATICS C (GRADUATED ASSESSMENT)
MODULE M9 – SECTION A

B279A

Candidates answer on the question paper

OCR Supplied Materials:

None

Other Materials Required:

- Geometrical instruments
- Tracing paper (optional)

Monday 9 March 2009
Morning

Duration: 30 minutes



Candidate Forename		Candidate Surname	
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Centre Number						Candidate Number				
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INSTRUCTIONS TO CANDIDATES

- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that 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.
- Answer **all** the questions.
- Do **not** write in the bar codes.
- Write your answer to each question in the space provided, however additional paper may be used if necessary.

INFORMATION FOR CANDIDATES

- The number of marks is given in brackets [] at the end of each question or part question.
- The total number of marks for this Section is **25**.
- This document consists of **8** pages. Any blank pages are indicated.

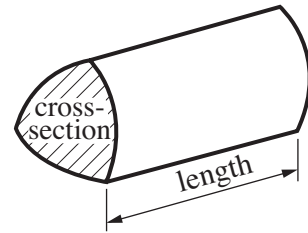
WARNING

No calculator can be used for Section A of this paper

FOR EXAMINER'S USE	
SECTION A	
SECTION B	
TOTAL	

Formulae Sheet

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

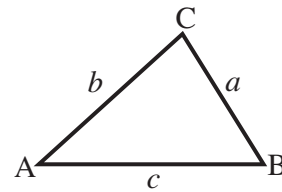


In any triangle ABC

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

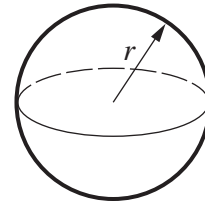
Cosine rule $a^2 = b^2 + c^2 - 2bc \cos A$

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



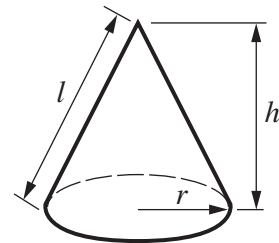
Volume of sphere = $\frac{4}{3} \pi r^3$

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

1 Estimate.

$$\frac{(4.16 \times 10^{-2}) \times (3.12 \times 10^9)}{5.89 \times 10^4}$$

Give your answer in standard form.

..... [3]

2 Evaluate.

(a) 7^0

(a) [1]

(b) 2^{-3}

(b) [1]

(c) $81^{\frac{1}{2}}$

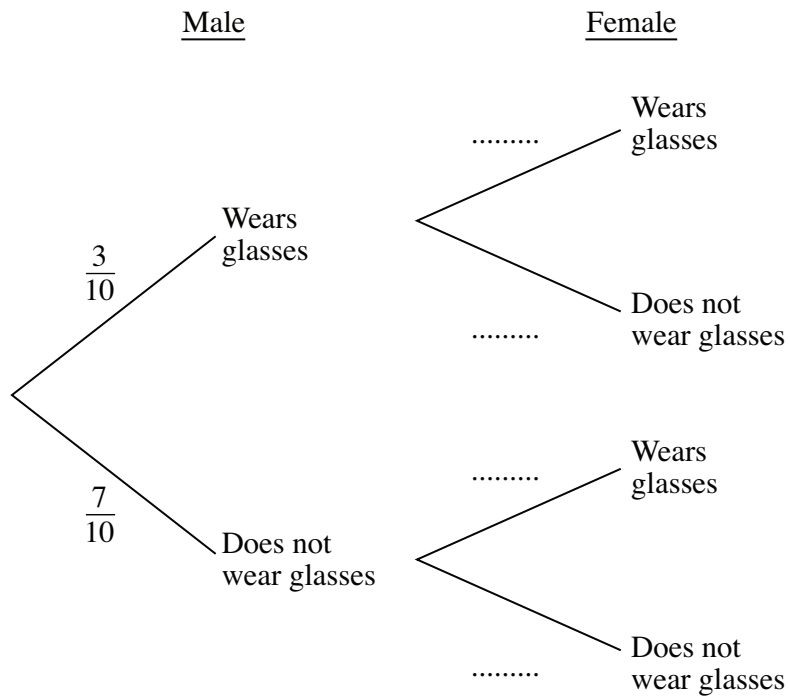
(c) [1]

3 The table shows information about the teaching staff at a school.

	Wear glasses	Do not wear glasses
Male	9	21
Female	5	35

A female teacher and a male teacher are chosen at random.

(a) Complete the probability tree diagram.



[2]

(b) Calculate the probability that both teachers wear glasses.

(b) [2]

4 (a) Expand and simplify.

$$(3x - 2)(x + 3)$$

(a) [3]

(b) (i) Factorise.

$$x^2 - 2x - 24$$

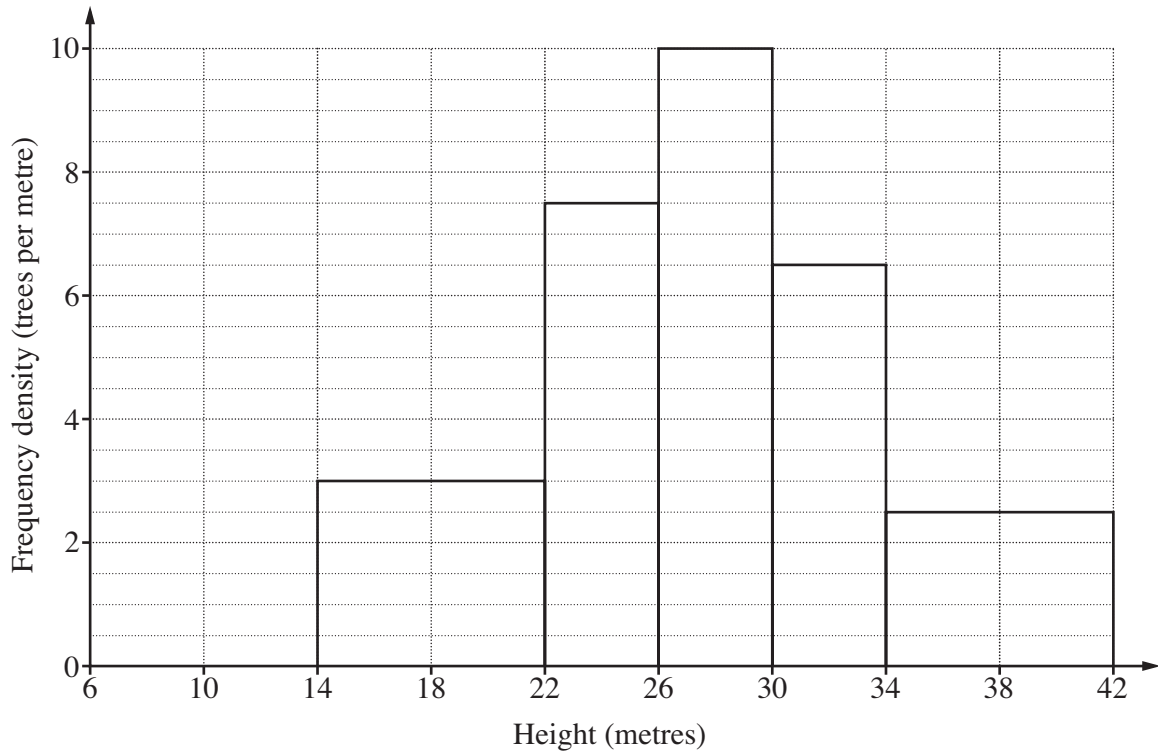
(b)(i) [2]

(ii) Hence simplify.

$$\frac{x^2 - 2x - 24}{x^2 - 16}$$

(ii) [3]

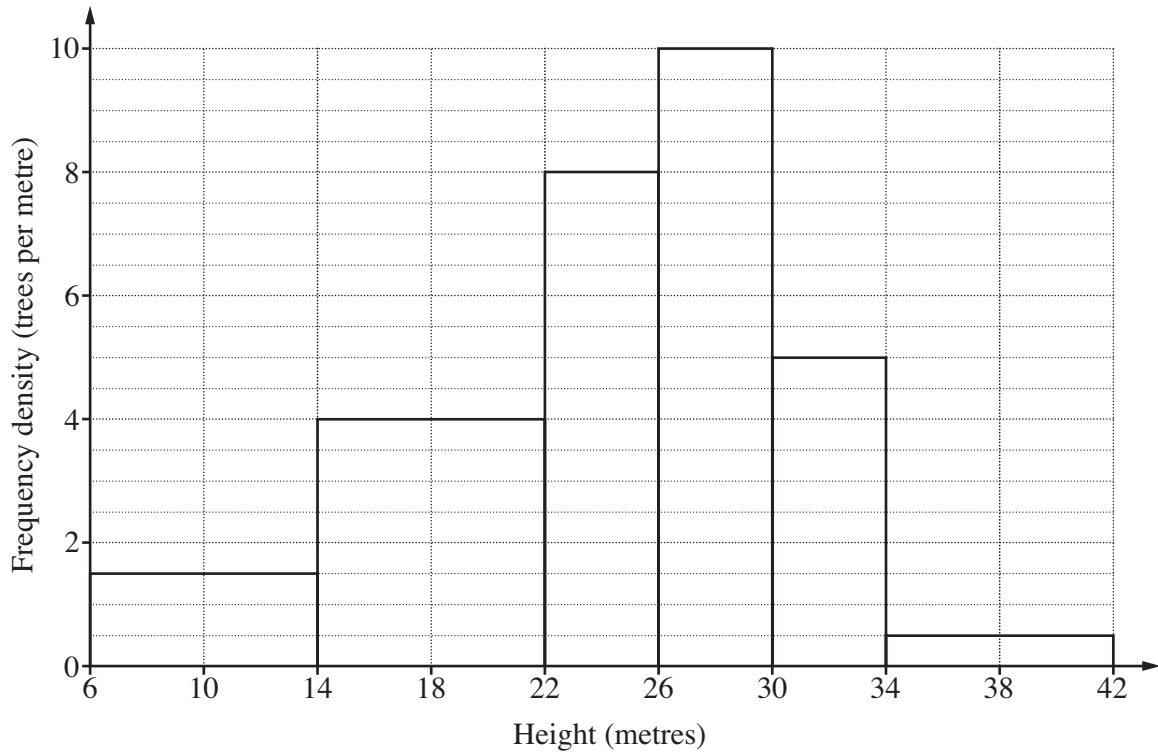
- 5 (a) This histogram shows the distribution of the heights of a sample of Ash trees in a woodland.



How many Ash trees were in the sample?

(a) [3]

- (b) This histogram shows the distribution of the heights of a sample of Oak trees in the woodland.

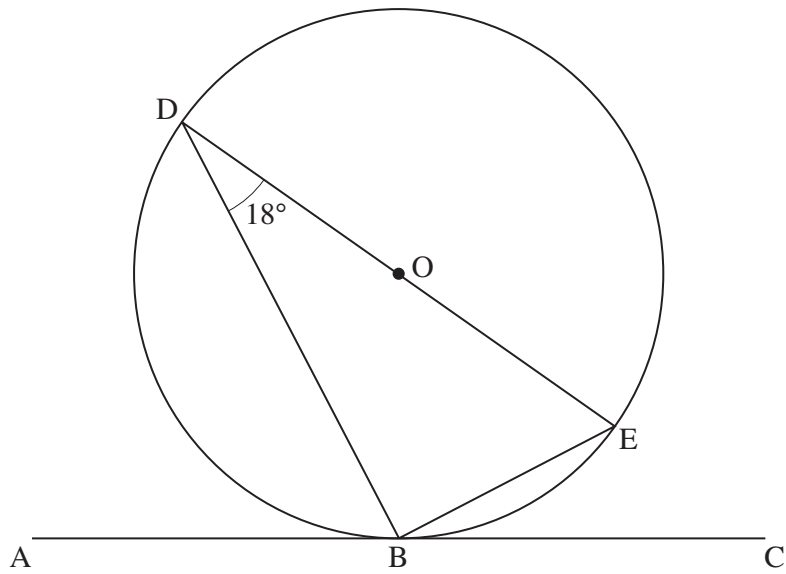


State one way in which the distributions of the heights of the Ash trees and the Oak trees are different.

.....
 [1]

TURN OVER FOR QUESTION 6

- 6 B, D and E are points on a circle, centre O.
 DE is a diameter.
 AC is the tangent to the circle at B.
 Angle BDE = 18° .



Not to scale

- (a) Give the reason why angle EBD is 90° .

..... [1]

- (b) Calculate angle ABD.
 Give reasons for your answer.

Angle ABD = $^\circ$ because

.....

..... [2]

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