

OXFORD CAMBRIDGE AND RSA EXAMINATIONS
General Certificate of Secondary Education

MATHEMATICS B (MEI)
PAPER 1 SECTION A
HIGHER TIER

1968/2313A

Tuesday **7 JUNE 2005** Afternoon 45 minutes

Candidates answer on the question paper.

Additional materials:

- Geometrical instruments
- Tracing paper (optional)

| Candidate Name | Centre Number | Candidate Number | | | | | | | | | | | | |
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TIME 45 minutes

INSTRUCTIONS TO CANDIDATES

- Write your name, Centre number and candidate number in the boxes above.
- Answer **all** the questions.
- Write your answers, in blue or black ink, in the spaces provided on the question paper.
- Read each question carefully and make sure you know what you have to do before starting your answer.
- Show all your working. Marks may be given for working which shows that you know how to solve the problem, even if you get the answer wrong.

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 36.



WARNING

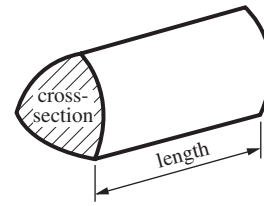
You are not allowed to use a calculator in Section A of this paper.

| FOR EXAMINER'S USE | |
|--------------------|--|
| Section A | |
| Section B | |
| TOTAL | |

This question paper consists of 7 printed pages and 1 blank page.

Formulae Sheet: Higher Tier

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

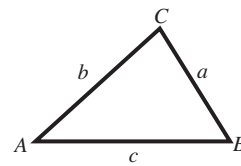


In any triangle ABC

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

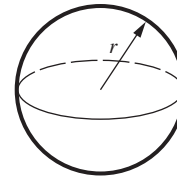
Cosine rule $a^2 = b^2 + c^2 - 2bc \cos A$

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



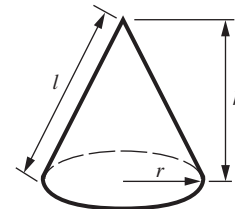
Volume of sphere = $\frac{4}{3} \pi r^3$

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

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

1 Estimate, showing your working.

$$\frac{511 \times 2.96}{0.302}$$

.....[3]

2 (a) Solve.

$$\frac{x}{5} + 3 = 14$$

(a)[2]

(b) Expand.

$$x(x^2 + 4)$$

(b)[2]

(c) Factorise.

$$4x^2 + 12xy$$

(c)[2]

3 (a) What is the reciprocal of 4?

(a)[1]

(b) Express $\frac{4}{9}$ as a recurring decimal.

(b)[1]

(c) Evaluate 5^0 .

(c)[1]

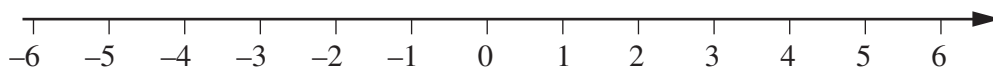
(d) The number 298 000 has been rounded to n significant figures.
State the smallest and largest possible values of n .

(d) smallest:; largest:[2]

4 Solve.

$$2x + 7 > 13$$

Illustrate your answer on the number line.

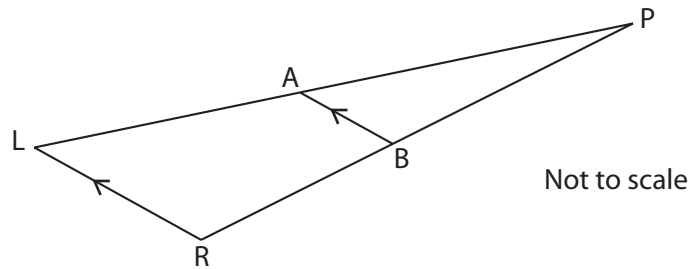


[3]

5



Robin is looking at a magic eye picture.
The diagram below is a plan view of the situation above.



Robin's left eye is at L, his right eye at R.
A and B are points on the picture.
LR and AB are parallel.
The line LA meets the line RB at P.

- (a) Complete the proof that triangles PLR and PAB are similar. [2]

1 Angle PLR = because

.....

2

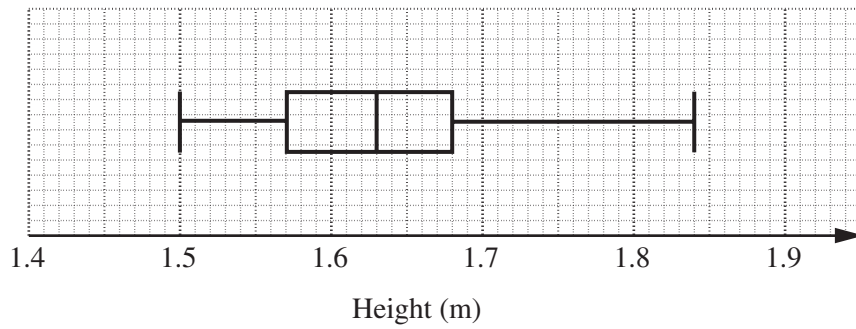
.....

Therefore triangles PLR and PAB are similar.

- (b) $LR = 7\text{ cm}$; $LP = 63\text{ cm}$; $AP = 18\text{ cm}$.
Calculate the length of AB.

(b)cm [2]
[Turn over

6 This box plot shows the heights of a group of 14 year old boys.



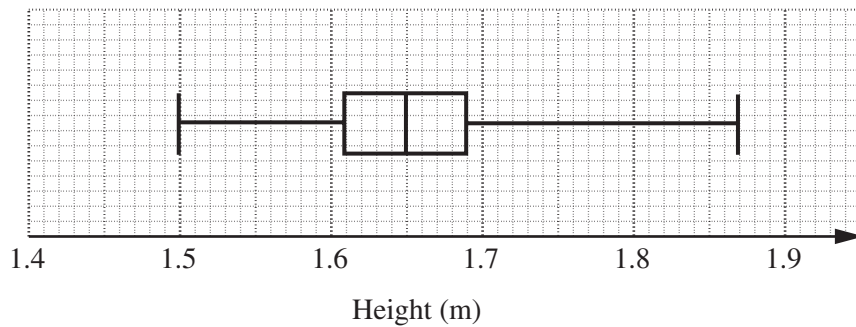
(a) (i) What is the height of the shortest boy?

(a)(i)m [1]

(ii) What is the median height?

(ii)m [1]

This box plot shows the heights of a group of 14 year old girls.



(b) Describe two differences between the heights of the boys and the heights of the girls.

1.
 [1]

2.
 [1]

7 Evaluate $8^{-\frac{2}{3}}$.

.....[3]

8 (a) Solve the equation $x^2 - 8x - 4 = 0$.
Leave your answer in the form $a \pm b\sqrt{5}$, where a and b are integers.

(a)[3]

(b) Solve.

$$(3x - 4)(x^2 - 9) = 0$$

(b)[2]

(c) $(x + p)^2 = x^2 - 6x + q$ is an identity.

Find the values of p and q .

(c) $p =$

$q =$ [3]

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