OCR
RECOGNISING ACHIEVEMENT

OXFORD CAMBRIDGE AND RSA EXAMINATIONS
General Certificate of Secondary Education

MATHEMATICS C **1966/2343A**
(Graduated Assessment)

HIGHER TERMINAL PAPER – SECTION A

Tuesday **8 JUNE 2004** Afternoon 1 hour

Candidates answer on the question paper.
Additional materials:
Geometrical instruments
Tracing paper (optional)

Candidate Name	Centre Number	Candidate Number

TIME 1 hour

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, on the dotted lines unless the question says otherwise.
- Read each question carefully and make sure you know what you have to do before starting your answer.
- There is a space after most questions. Use it to do your working. In many questions marks will be given for a correct method even if the answer is incorrect.

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 50.

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 12 printed pages.

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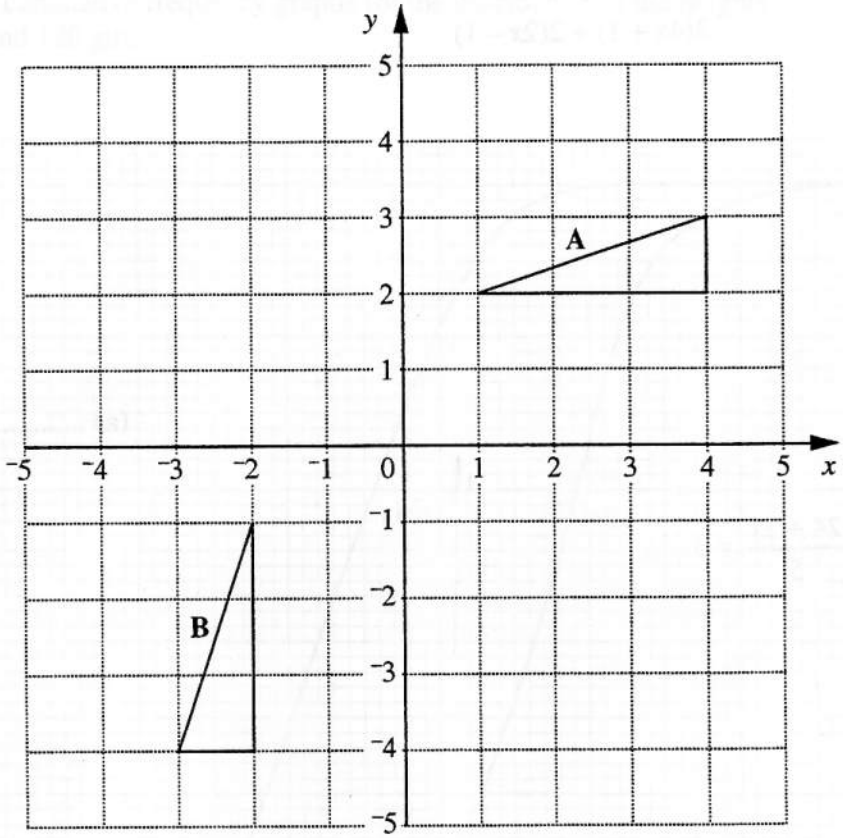
[Turn over

1



(a) Describe fully the **single** transformation that maps triangle **A** onto triangle **B**.

.....

.....[2]

(b) Rotate triangle **A** through 90° clockwise about the point (1,1).
Label the image C.

[2]

4

[Turn over

2 **(a)** Expand and simplify.

$$3(4x + 1) + 2(2x - 1)$$

(a) .....[2]

(b) Solve.

$$\frac{24 + 2x}{5} = 3$$

(b) ..... [3]

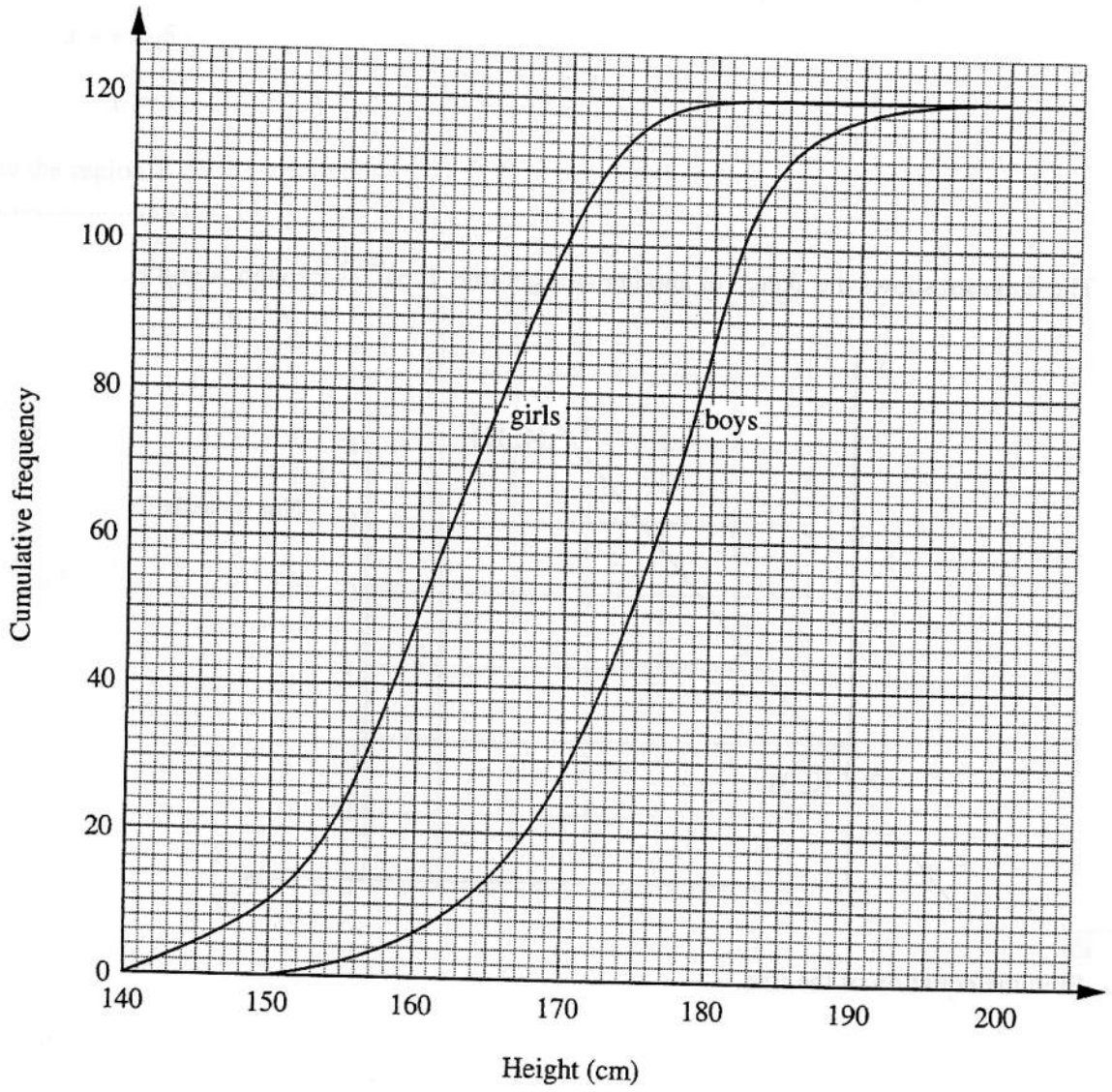
(c) Solve by factorising.

$$x^2 + 5x - 36 = 0$$

(c) ..... [3]

8

3 These are the cumulative frequency graphs for the distribution of the heights of 120 boys and 120 girls.



(a) How many boys are not more than 180 cm tall?

(a) .....[1]

(b) What is the difference in the median heights of the boys and the girls?

(b) .....cm [2]

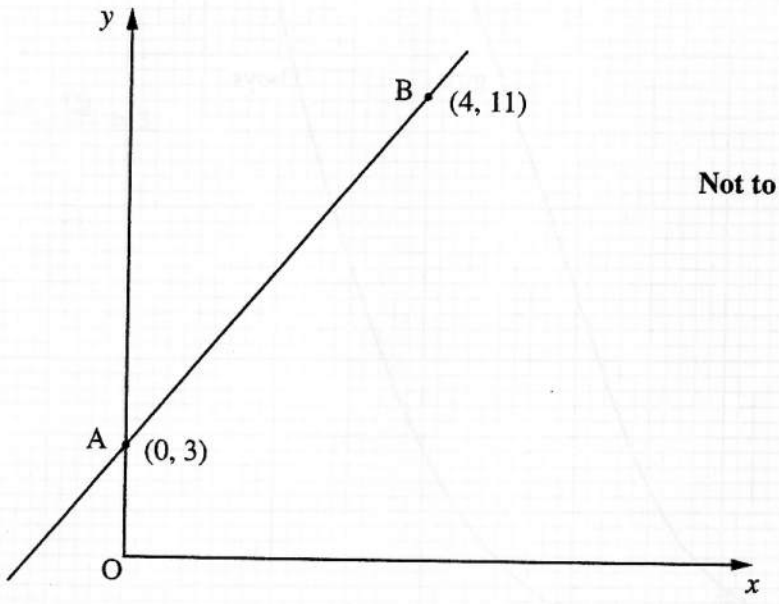
3

4 **(a)** The equation of a straight line is $y = 4x - 2$.

Make x the subject of this equation.

(a) .....[2]

(b) The diagram shows the sketch of another straight line. It passes through A and B.



Not to scale

Find the equation of the line.

(b) .....[3]

5

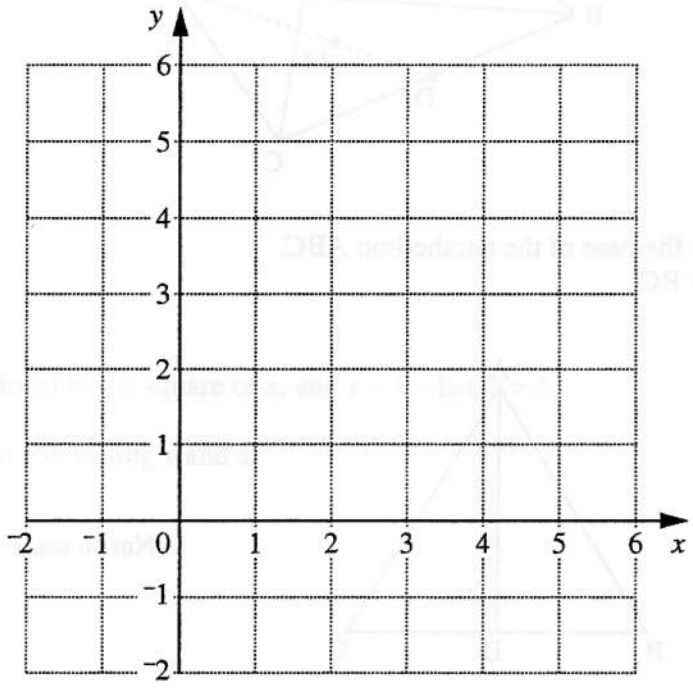
5 The region **R** is defined by these inequalities.

$$y \geqslant x + 1$$

$$x + y \leqslant 5$$

$$x \geqslant 1$$

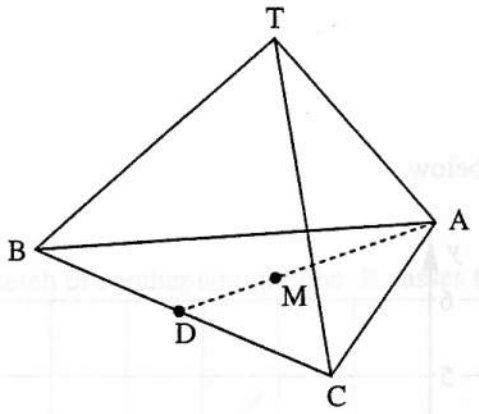
Show the region **R** on the grid below.



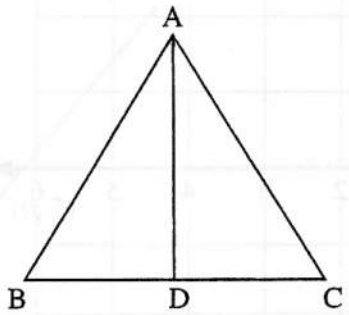
[4]

4

6 ABCT is a regular tetrahedron with ABC horizontal.
The length of each edge is 6 cm.



This diagram shows the base of the tetrahedron ABC.
D is the midpoint of BC.



Not to scale

(a) Show that the length AD is $3\sqrt{3}$ cm.

[3]

(b) M is the point on AD such that $AM = \frac{2}{3}AD$.

T is vertically above M.

Calculate TM, writing your answer in the form $a\sqrt{b}$.

(b) .....cm [3]

6

7 y is inversely proportional to the square of x, and $y = 4$ when $x = 5$.

(a) Find the equation connecting y and x.

(a) .....[3]

(b) Calculate y when $x = 0{\cdot}5$.

(b) .....[1]

4

[Turn over

8 **(a)** Evaluate.

$$16^{-\frac{1}{2}} \times 8^{\frac{2}{3}}$$

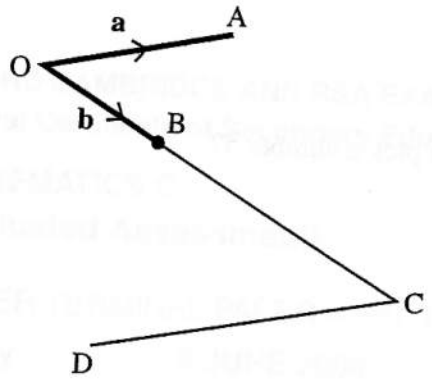
(a) .....[3]

(b) Express $0\dot{2}\dot{7}$ as a fraction in its simplest form.

(b) .....[3]

6

9 In the diagram $\overrightarrow{OA} = \mathbf{a}$ and $\overrightarrow{OB} = \mathbf{b}$.



Not to scale

C is the point such that $\overrightarrow{BC} = 2\overrightarrow{OB}$.
D is the point such that $\overrightarrow{DC} = 2\overrightarrow{OA}$.

(a) Find, in terms of **a** and **b**,

(i) $\overrightarrow{AB}$,

(a)(i) .....[1]

(ii) $\overrightarrow{BD}$.

(ii) .....[2]

(b) Prove that DCB and AOB are similar triangles.

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.....[2]

5

TURN OVER FOR QUESTION 10

10 Jodie and Karen play a game with a pack of 40 numbered cards.
There are four cards with each number from 0 to 9.

Jodie picks a card and keeps it.
Karen then picks a card.

(a) What is the probability that they both pick a number 5?

(a) .....[2]

(b) After each game they replace the cards.

They play the game 50 times.
They each pick a card with the same number in 12 of the games.

Is this more than you would expect or less?
Explain your answer clearly, showing your calculations.

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.....[3]

5