OCR
RECOGNISING ACHIEVEMENT

B278A

GENERAL CERTIFICATE OF SECONDARY EDUCATION
MATHEMATICS C (GRADUATED ASSESSMENT)
MODULE M8 – SECTION A

M8

TUESDAY 11 MARCH 2008

Morning
Time: 30 minutes

Candidates answer on the question paper
Additional materials (enclosed): None

Additional materials (required):
Geometrical instruments
Tracing paper (optional)

CUP/T57751

Candidate Forename		Candidate Surname	
Centre Number		Candidate Number	

INSTRUCTIONS TO CANDIDATES

- Write your name in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use blue or 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.

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**.

WARNING

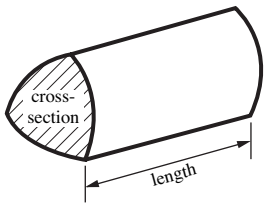
You are not allowed to use a calculator in Section A of this paper.

FOR EXAMINER'S USE	
SECTION A	
SECTION B	
TOTAL	

This document consists of **8** printed pages.

Formulae Sheet

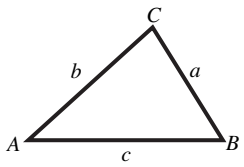
Volume of prism = (area of cross-section) × length



In any triangle ***ABC***

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

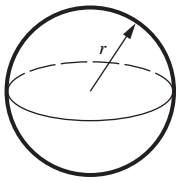
Cosine rule $a^2 = b^2 + c^2 - 2bc\cos A$



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

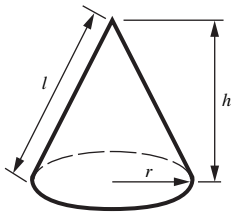
Volume of sphere = $\frac{4}{3}\pi r^3$

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



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

Curved surface area of cone = πrl



The Quadratic Equation

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

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

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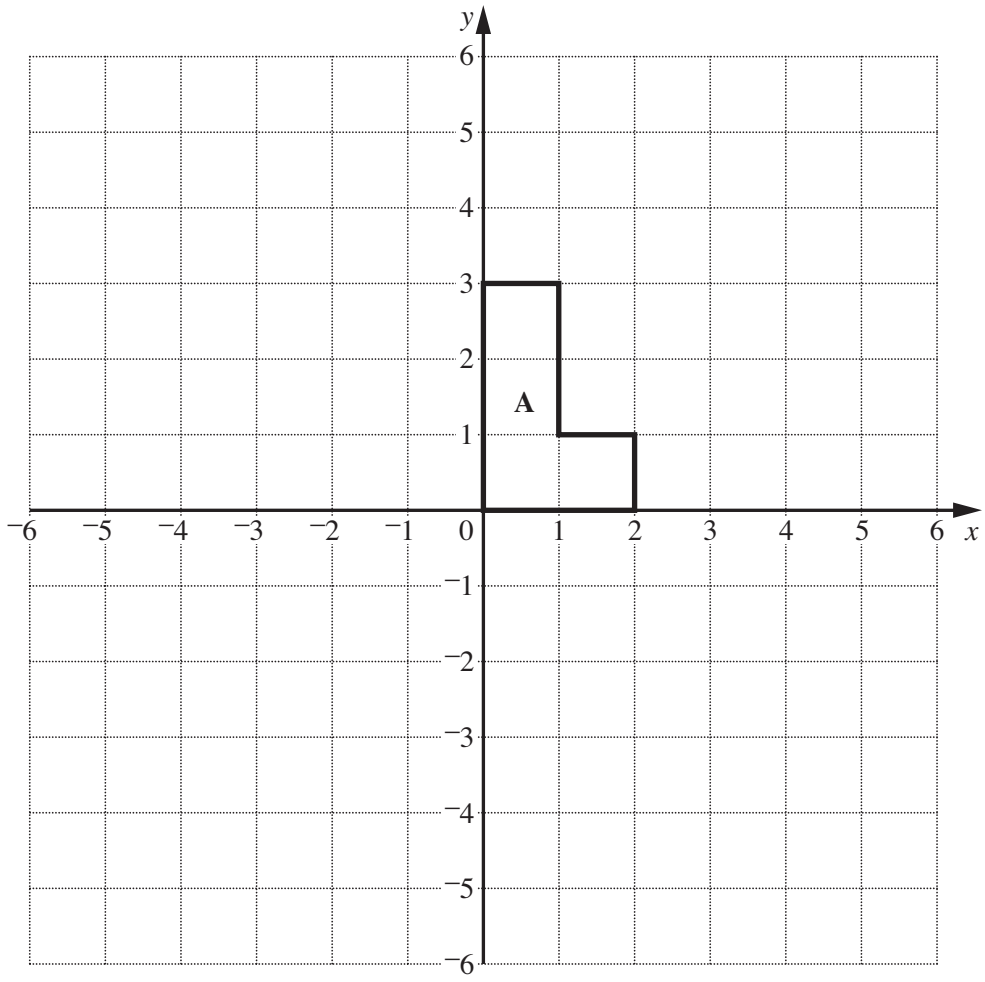
1



(a) Rotate shape **A** 90° anticlockwise about (0, 0).
Label the image **B**. [2]

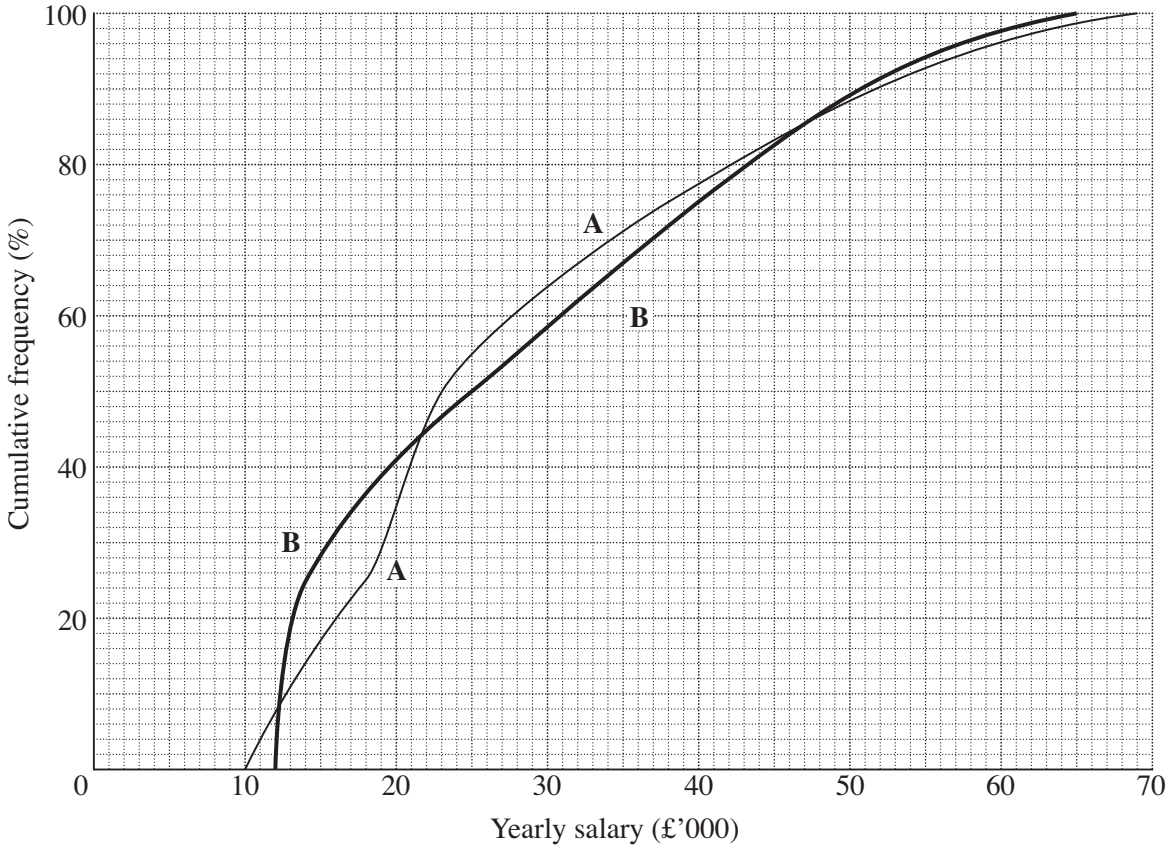
(b) Then rotate shape **B** 90° clockwise about (−3, 0).
Label the image **C**. [2]

(c) Describe fully the **single** transformation which maps shape **A** onto shape **C**.

.....

..... [2]

2 These cumulative frequency graphs show the distributions of the annual salaries of employees working in two companies, **A** and **B**.



(a) Use the graphs to complete this table for the two companies.

	A	**B**
Median (£)	.....	25000
Range (£)	59000	53000
Interquartile range (£)	20000	.....

[3]

(b) In which company are salaries generally lower?
Explain your answer, using data from the table.

Salaries are lower in company ..... because .....

..... [1]

3 Solve algebraically these simultaneous equations.

$$5x - 2y = 12$$
$$7x + 2y = 24$$

$x =$ .....

$y =$ ..... [2]

4 Calculate.

$$4\frac{1}{4} - 1\frac{3}{5}$$

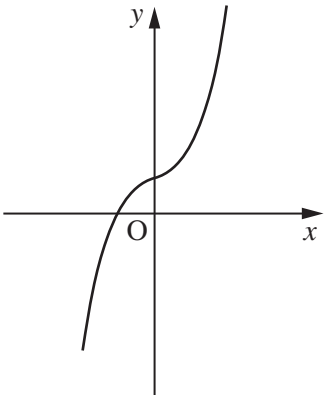
Write your answer as a mixed number.

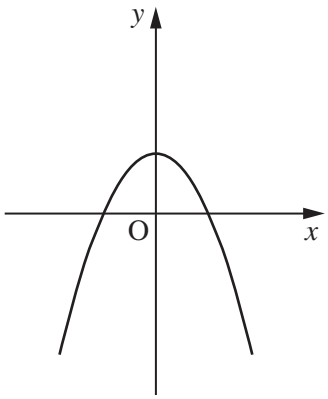
..... [3]

5 For each of the sketch graphs below, select the correct equation from this list.

$y = x^2 - 3$ $\quad$ $y = x^3 - 3$ $\quad$ $y = 3 - x^2$

$y = 3 - x^3$ $\quad$ $y = x^3 + 3$ $\quad$ $y = x^2 + 3$





$y =$ ..... $y =$ ..... [2]

6 Calculate, giving each answer in standard form.

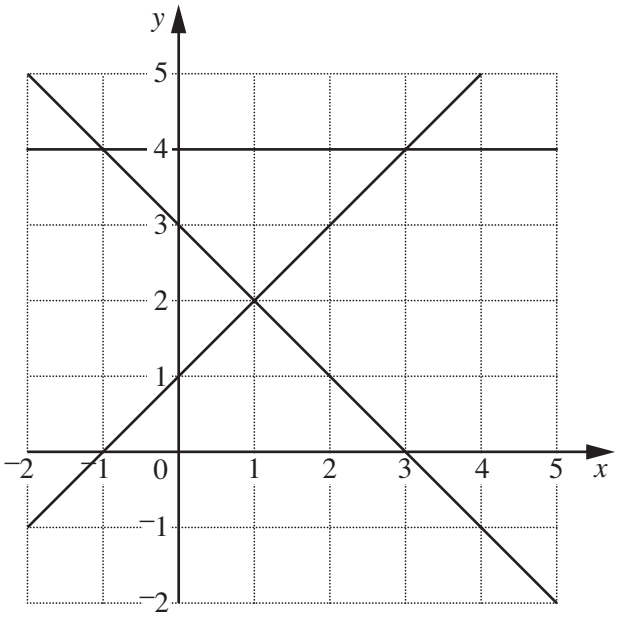
(a) $(3 \times 10^5) \times (2 \times 10^3)$

(a) ..... [1]

(b) $(8 \times 10^3) + (3 \times 10^2)$

(b) ..... [2]

7 The diagram shows the graphs of $y = 4$, $x + y = 3$ and $y = x + 1$.



Show clearly the region, R, which satisfies all these inequalities.

$y \leqslant 4$ $x + y \geqslant 3$ $y \leqslant x + 1$ [3]

8 In these expressions, p, q and r represent lengths.

$2p^2 + 3q^2$ $p(q^2 - r^2)$ $pqr + qr$ $p + q + r$

Which one of these expressions could represent a volume?
Explain how you decide.

..... because .....

..... [2]

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