

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

**B278A**

Candidates answer on the Question Paper

**OCR Supplied Materials:**  
None

**Other Materials Required:**

- Geometrical instruments
- Tracing paper (optional)

**Thursday 21 January 2010**  
**Afternoon**

**Duration: 30 minutes**



Candidate Forename		Candidate Surname	
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Centre Number						Candidate Number				
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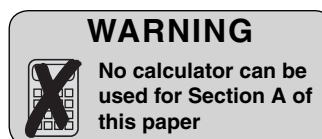
## MODIFIED LANGUAGE

### 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.

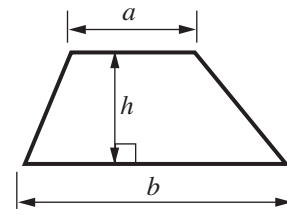
### INFORMATION FOR CANDIDATES

- 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.

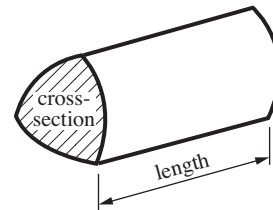


## Formulae Sheet

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



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

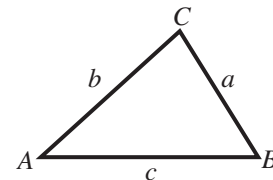


**In any triangle ABC**

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

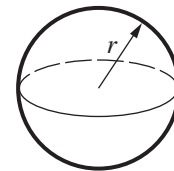
**Cosine rule**  $a^2 = b^2 + c^2 - 2bc \cos A$

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



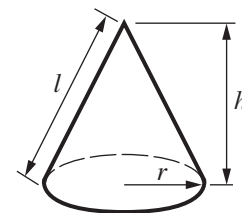
**Volume of sphere** =  $\frac{4}{3}\pi r^3$

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



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

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



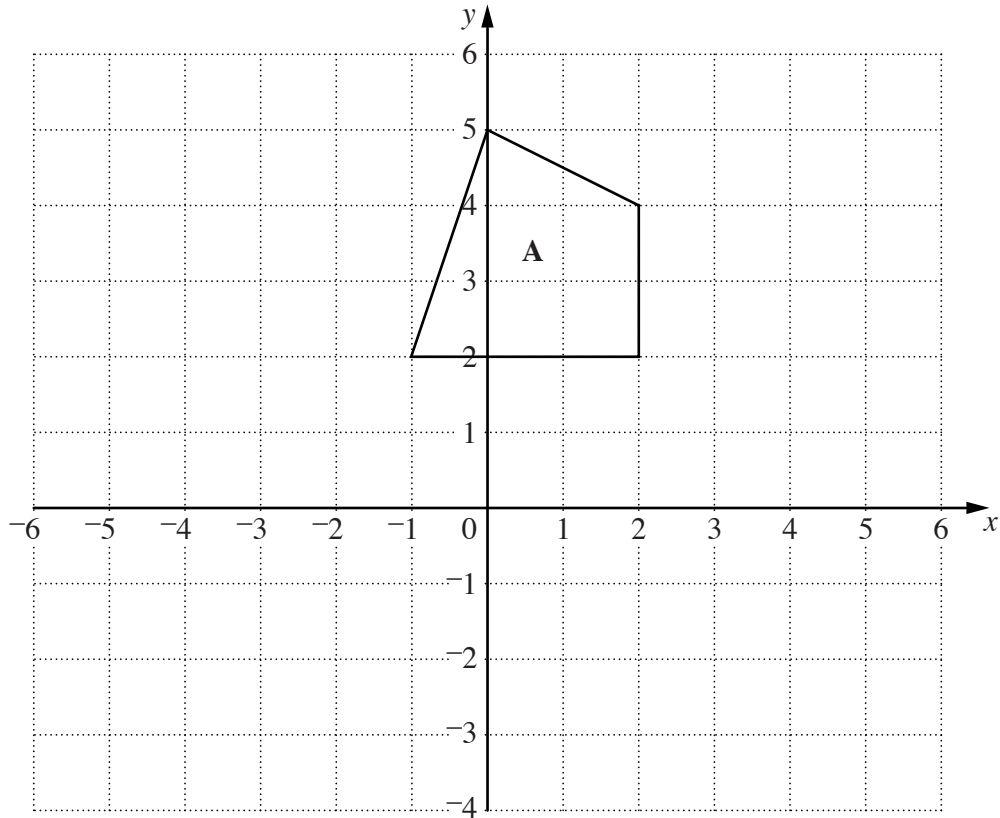
**The Quadratic Equation**

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

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

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1



- (a) Rotate shape **A** through  $180^\circ$  with centre (2, 2).  
Label the image **B**.

[2]

- (b) Translate shape **B** by the vector  $\begin{pmatrix} -6 \\ 0 \end{pmatrix}$ .

Label the image **C**.

[2]

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

.....  
 .....

[2]

- 2 Heather has some shares in a company.  
She paid £5 for each share.  
Each share is now worth £8.50.

Work out the percentage increase in the value of each share.

..... % [3]

- 3 Work out.

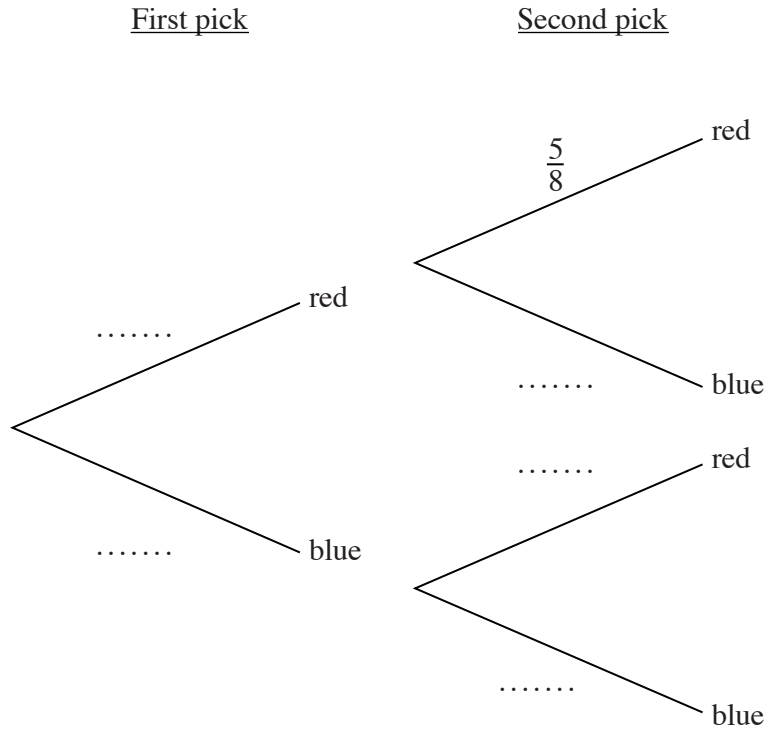
$$3\frac{1}{4} \times 1\frac{1}{3}$$

Give your answer as a mixed number in its simplest form.

..... [3]

- 4 A bag contains 8 counters. 5 are red and 3 are blue. Umar picks a counter at random and then replaces it. Umar then picks a second counter at random.

(a) Complete the tree diagram.



[2]

(b) Work out the probability that Umar picks one counter of each colour.

(b) ..... [3]

- 5 Craig has completed some algebra homework. In each of his answers, he has made a mistake.

Explain the mistake in each answer.

**Question (a)**

Expand  $x(x + 3)$ .

**Craig's answer**

$$x(x + 3) = 2x + 3x = 5x$$

Mistake is .....

..... [1]

**Question (b)**

Expand  $(x - 3)(x + 4)$ .

**Craig's answer**

$$(x - 3)(x + 4) = x^2 - 12$$

Mistake is .....

..... [1]

**Question (c)**

Factorise  $x^2 - 36$ .

**Craig's answer**

$$x^2 - 36 = (x - 6)(x - 6)$$

Mistake is .....

..... [1]

6 (a) Solve.

$$x^2 - 5x - 14 = 0$$

(a) ..... [3]

(b) Rearrange this formula to make  $p$  the subject.

$$m = \sqrt{\frac{p}{7}}$$

(b) ..... [2]

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