

**GENERAL CERTIFICATE OF SECONDARY EDUCATION**  
**MATHEMATICS C (GRADUATED ASSESSMENT)**  
MODULE M10 – SECTION A

**B280A**

Candidates answer on the Question Paper

**OCR Supplied Materials:**  
None

**Other Materials Required:**

- Geometrical instruments
- Tracing paper (optional)

**Monday 8 March 2010**  
**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.

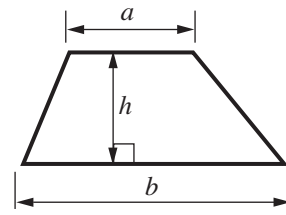
**WARNING**



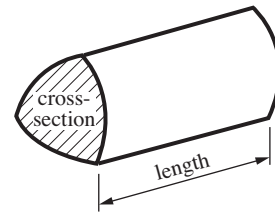
No calculator can be used for Section A of this paper

## Formulae Sheet

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



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

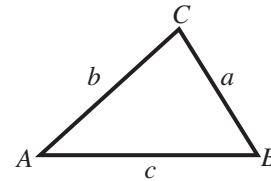


**In any triangle  $ABC$**

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

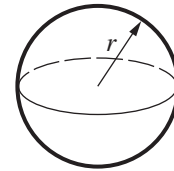
**Cosine rule**  $a^2 = b^2 + c^2 - 2bc \cos A$

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



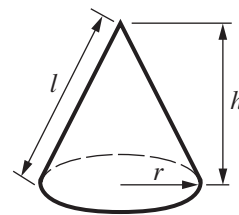
**Volume of sphere** =  $\frac{4}{3}\pi r^3$

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



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

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



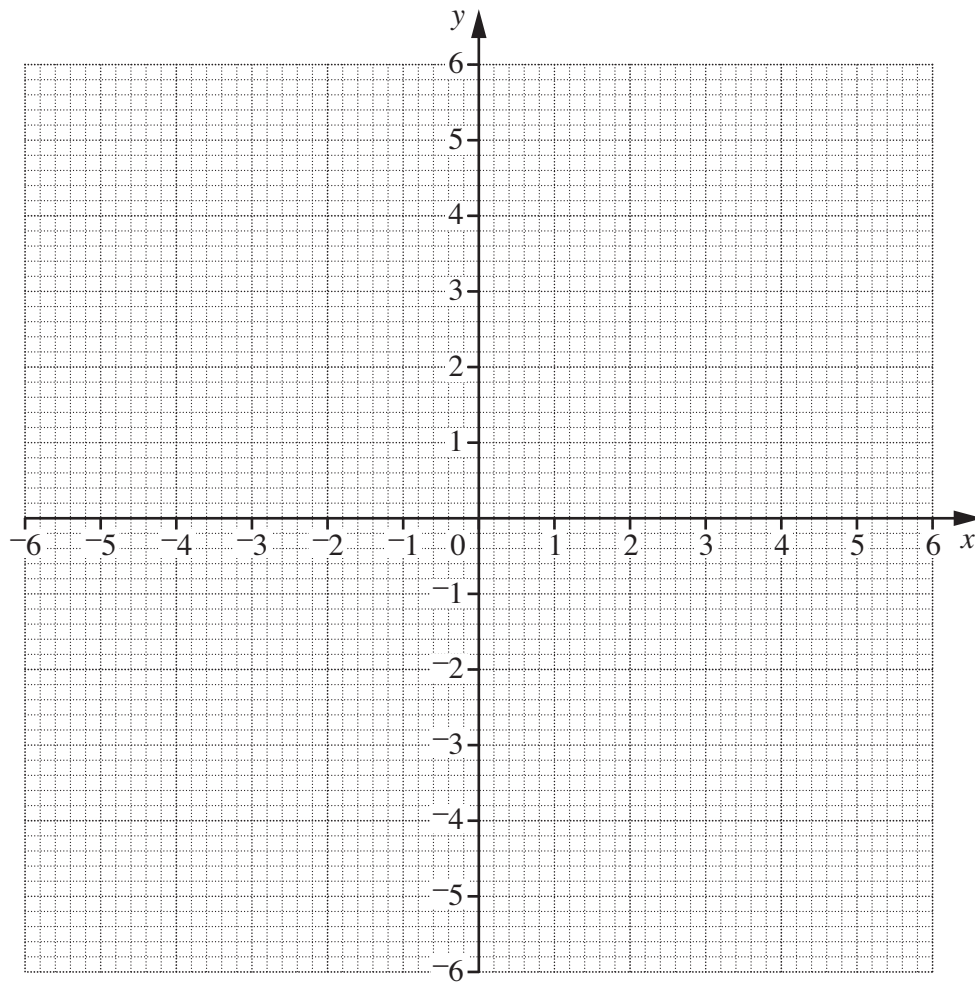
**The Quadratic Equation**

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) Draw the graph of  $x^2 + y^2 = 9$ .



[2]

- (b) Solve **graphically** these simultaneous equations.

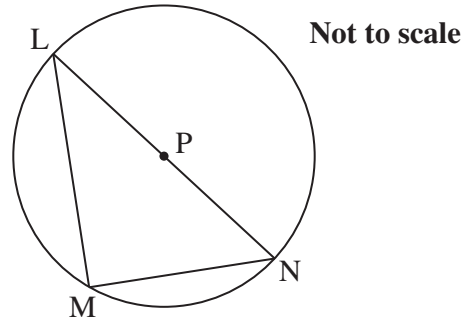
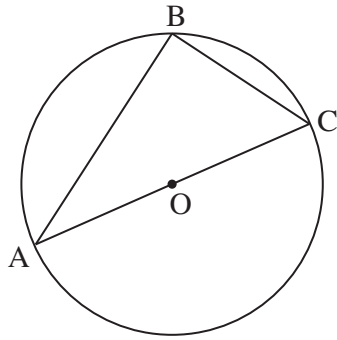
$$\begin{aligned}x^2 + y^2 &= 9 \\ y &= 4 - 2x\end{aligned}$$

(b)  $x = \dots\dots\dots, y = \dots\dots\dots$

$x = \dots\dots\dots, y = \dots\dots\dots$  [3]

- 2 A, B and C are points on the circumference of a circle, centre O.  
 L, M and N are points on the circumference of a circle, centre P.

$OA = 6\text{ cm}$ ,  $BC = 5\text{ cm}$ ,  $PL = 6\text{ cm}$  and  $MN = 5\text{ cm}$ .



Prove that triangles ABC and LMN are congruent.

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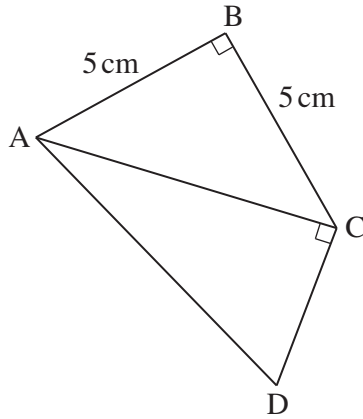
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..... [3]

- 3 ABCD is a quadrilateral.  
 AB = BC = 5 cm.  
 Angle ABC = angle ACD = 90°.



Not to scale

- (a) Show that  $AC = 5\sqrt{2}$  cm.

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..... [2]

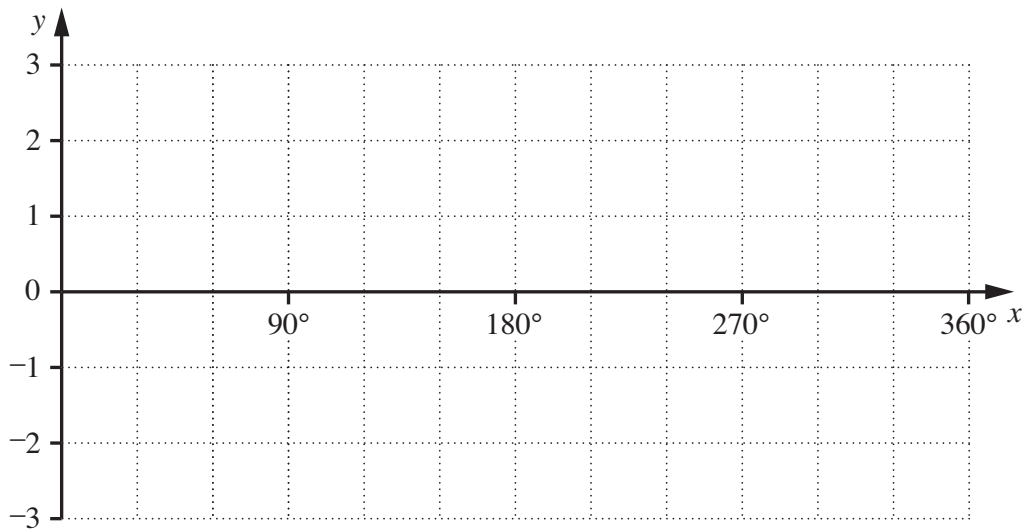
- (b) Given that  $AD = 7\sqrt{2}$  cm, work out the length CD.  
 Write your answer in the form  $a\sqrt{b}$  where  $a$  and  $b$  are integers and  $b$  is as small as possible.

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

4 Change  $0.\dot{2}1\dot{3}$  into a fraction in its simplest form.

..... [3]

5 Sketch the graph of  $y = 2 \cos 3x$  for  $0^\circ \leq x \leq 360^\circ$ .



[3]

6 (a) Expand and simplify.

$$(4x + 7)(x + 5)$$

(a) ..... [2]

(b) Hence solve this equation.

$$\frac{x-5}{x+5} = 4x + 7$$

(b) ..... [4]

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