

<b>Candidate Forename</b>		<b>Candidate Surname</b>	
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<b>Centre Number</b>						<b>Candidate Number</b>				
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**OXFORD CAMBRIDGE AND RSA EXAMINATIONS  
GENERAL CERTIFICATE OF SECONDARY EDUCATION**

**B282A**

**MATHEMATICS C  
(GRADUATED ASSESSMENT)**

**Terminal Paper – Section A (Higher Tier)**

**MONDAY 1 JUNE 2009: Morning**

**DURATION: 1 hour**

**SUITABLE FOR VISUALLY IMPAIRED CANDIDATES**

**Candidates answer on the question paper**

**OCR SUPPLIED MATERIALS:**

**None**

**OTHER MATERIALS REQUIRED:**

**Geometrical instruments**

**Tracing paper (optional)**

**WARNING**

**No calculator can be used for  
Section A of this paper.**

**READ INSTRUCTIONS OVERLEAF**

## **INSTRUCTIONS TO CANDIDATES**

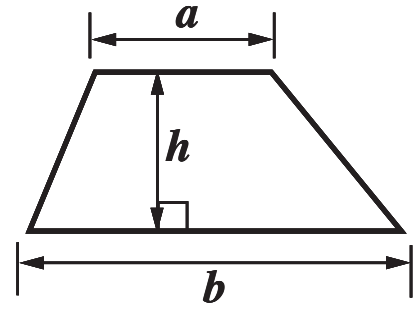
- **Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes on the first page.**
- **Use black ink. Pencil may be used for graphs and diagrams only.**
- **Read each question carefully and make sure that you know what you have to do before starting your answer.**
- **Show your working. Marks may be given for a correct method even if the answer is incorrect.**
- **Answer ALL the questions.**
- **Write your answer to each question in the space provided, however additional paper may be used if necessary.**

## **INFORMATION FOR CANDIDATES**

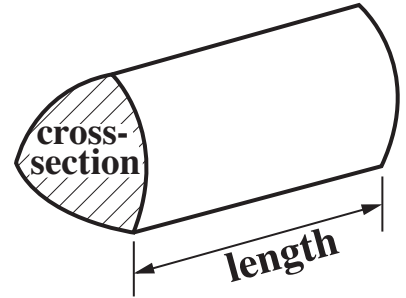
- **The number of marks is given in brackets [ ] at the end of each question or part question.**
- **The total number of marks for this Section is 50.**

## Formulae Sheet

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



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

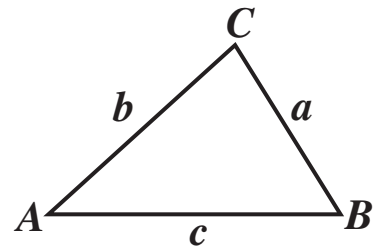


**In any triangle ABC**

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

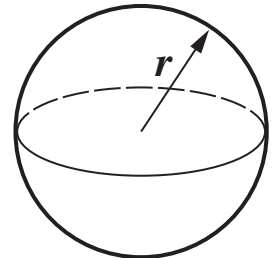
**Cosine rule**  $a^2 = b^2 + c^2 - 2bc \cos A$

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



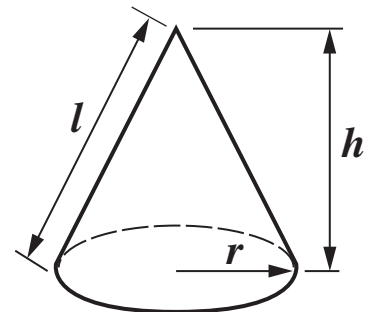
**Volume of sphere** =  $\frac{4}{3}\pi r^3$

**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

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

**1 For a drink, Meera mixes lime cordial and lemonade in the ratio 1 : 4.**

**(a) How much lemonade does she need to use with 100 ml of lime cordial?**

**[1 mark]**

**(a) \_\_\_\_\_ ml**

**(b) Meera wants to make 800 ml of this drink.**

**Calculate how much lime cordial she needs.**

**[2 marks]**

**(b) \_\_\_\_\_ ml**

**(c) Meera drinks 480 ml of the 800 ml.**

**Write the ratio 480 : 800 as simply as possible.**

**[2 marks]**

**(c) \_\_\_\_\_ : \_\_\_\_\_**

- 2 (a) Insert brackets in each of the following calculations so that they are correct.

$$2 + 5 \times -4 = -28$$

$$2 \times 5 + -4^2 = 2$$

$$2 \times 5 + -4^2 = 36$$

[3 marks]

- (b) Expand.

$$5(3x - 4)$$

[1 mark]

(b) \_\_\_\_\_

**(c) Factorise fully.**

$$6x + 3x^2$$

**[2 marks]**

**(c)** \_\_\_\_\_

**3 Here are three consecutive integers.**

$$n \qquad n + 1 \qquad n + 2$$

- (a) Find an expression for the sum of these three integers. Write your answer as simply as possible.**

**[1 mark]**

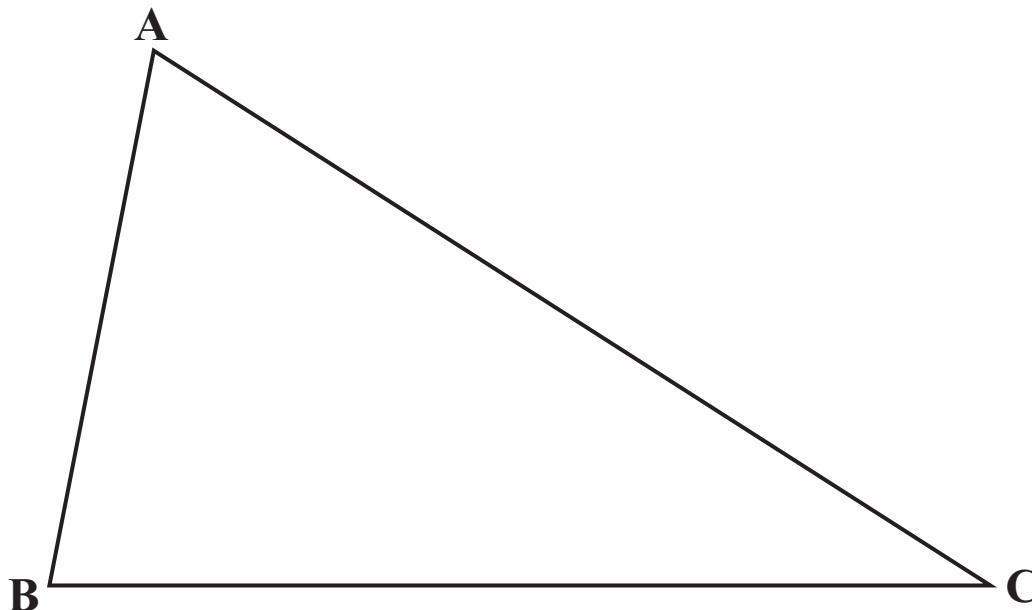
**(a)** \_\_\_\_\_

- (b) Explain how you can tell from the answer to part (a) that the sum of three consecutive integers is ALWAYS divisible by 3.**

\_\_\_\_\_  
\_\_\_\_\_  
**[1 mark]**



**4 The diagram below shows a triangle ABC.**



**(a) Using ruler and compasses only, construct the bisector of angle ABC.**

**Leave in all your construction lines.**

**[2 marks]**

**(b) The bisector of angle ABC intersects AC at D.**

**Measure AD.**

**[1 mark]**

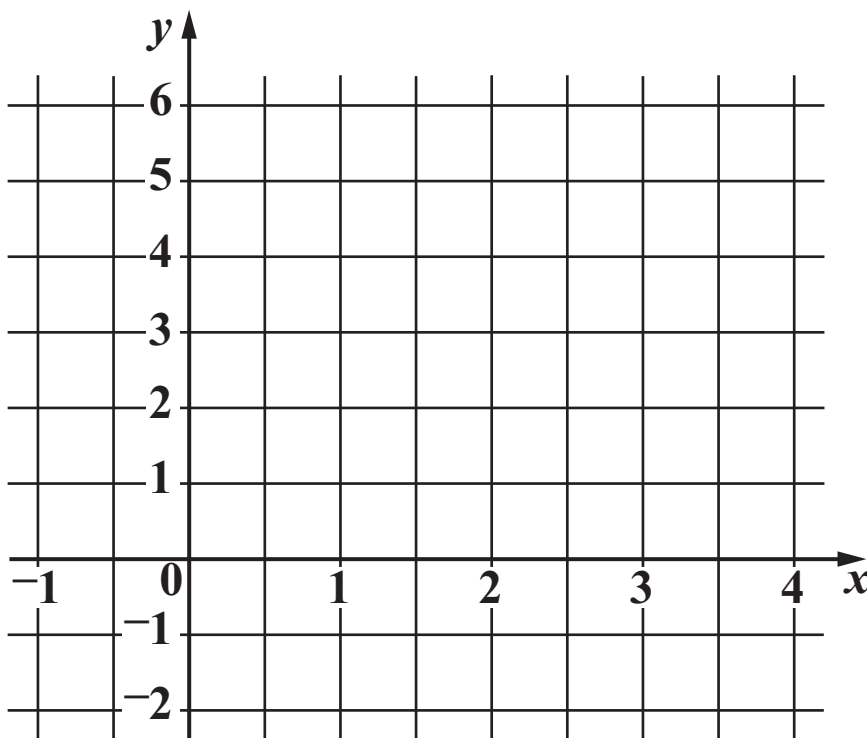
**(b) \_\_\_\_\_ cm**

5 (a) Complete the table for  $y = 3 + 3x - x^2$ .

$x$	-1	0	1	2	3	4
$y$	-1	3			3	-1

[1 mark]

(b) Draw the graph of  $y = 3 + 3x - x^2$ .



[2 marks]

(c) Use your graph to find the values of  $x$  for which  $3 + 3x - x^2 = 0$ .

[2 marks]

(c) \_\_\_\_\_

**6 (a) Solve.**

$$5x - 2 = x + 4$$

**[3 marks]**

**(a)** \_\_\_\_\_

**(b) Simplify.**

**(i)  $3a^2b \times 4a^3b$**

**[2 marks]**

**(b)(i)** \_\_\_\_\_

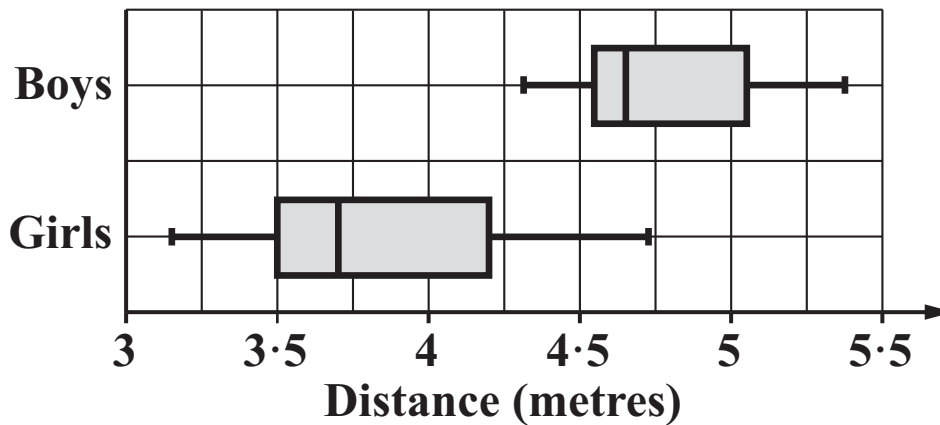
(ii) Simplify.

$$(x^3)^4$$

(ii) \_\_\_\_\_

[1 mark]

- 7 These box plots represent data for the distances jumped in a Long Jump competition by boys and girls in the under-15 age group.



- (a) Find the median for the girls.

(a) \_\_\_\_\_ m

[1 mark]

**(b) Find the interquartile range for the boys.**

**[2 marks]**

**(b) \_\_\_\_\_ m**

**(c) Make two comparisons between the distributions of the distances jumped by the boys and the girls.**

**1 \_\_\_\_\_**

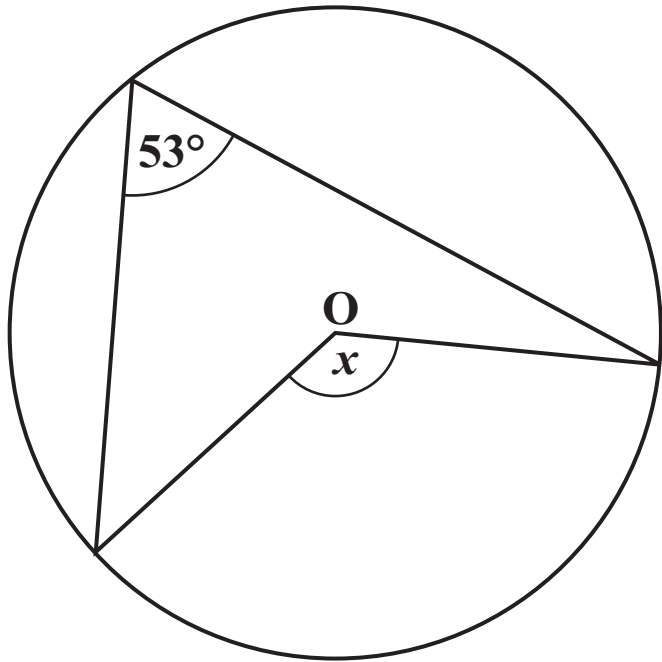
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**2 \_\_\_\_\_**

\_\_\_\_\_

**[2 marks]**

8 (a) In this diagram, O is the centre of the circle.



Not to scale

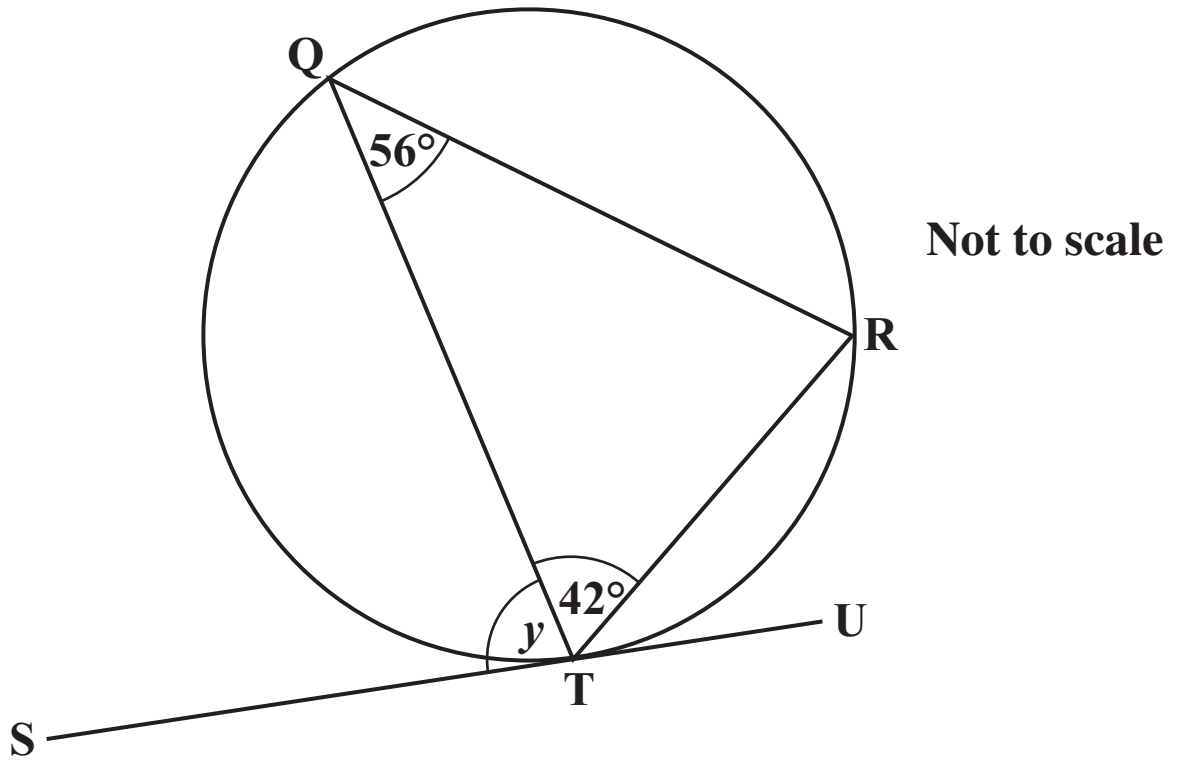
Find angle  $x$ , giving your reason.

$x =$  \_\_\_\_\_  $^{\circ}$  because \_\_\_\_\_

---

[2 marks]

(b) In this diagram, the tangent STU meets the circle at T.



Find angle  $y$ , giving your reasons.

$y =$  \_\_\_\_\_  $^{\circ}$  because \_\_\_\_\_

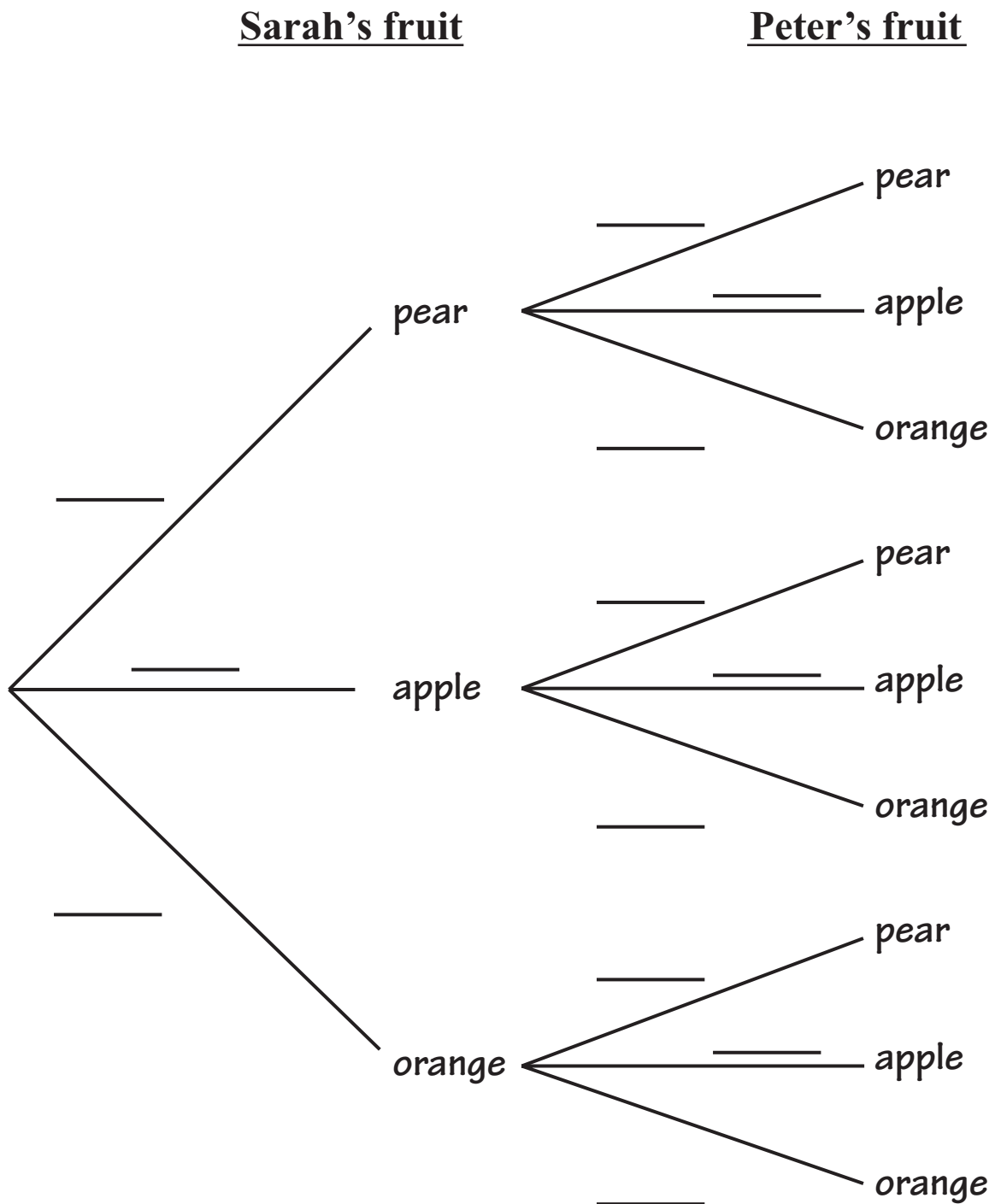
\_\_\_\_\_

\_\_\_\_\_

[3 marks]

- 9 A bowl contains 10 fruits.  
 There are 3 pears, 5 apples and 2 oranges.  
 Sarah takes a fruit at random from the bowl to eat at lunchtime.  
 Peter then takes a fruit at random from the bowl.

(a) Complete this tree diagram to show the probabilities of the fruits taken.



[3 marks]



**(b) Calculate the probability that both Sarah and Peter take a pear.**

**[2 marks]**

**(b)** \_\_\_\_\_

**(c) Calculate the probability that at least one of Sarah and Peter takes an apple.**

**[3 marks]**

**(c)** \_\_\_\_\_

**10 Find algebraically the coordinates of the points of intersection of the curve  $y = x^2 + 7x + 9$  and the line  $y = x + 4$ .**

**[5 marks]** ( \_\_\_\_\_ , \_\_\_\_\_ ) and ( \_\_\_\_\_ , \_\_\_\_\_ )

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