Candidate Forename		Candidate Surname	

Centre Number						Candidate Number				

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

DC (SM/SW) OV90861 11137/2

INSTRUCTIONS TO CANDIDATES

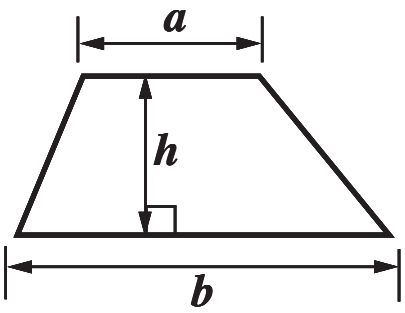
- **Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes on the first page.**
- **Use black ink. Pencil may be used for graphs and diagrams only.**
- **Read each question carefully and make sure that you know what you have to do before starting your answer.**
- **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

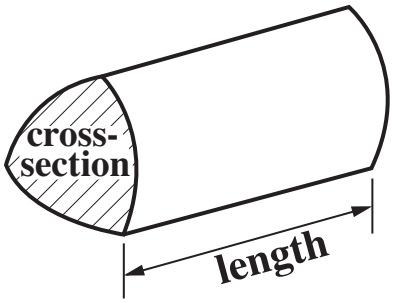
- **The number of marks is given in brackets [ ] at the end of each question or part question.**
- **The total number of marks for this Section is 50.**

Formulae Sheet

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



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

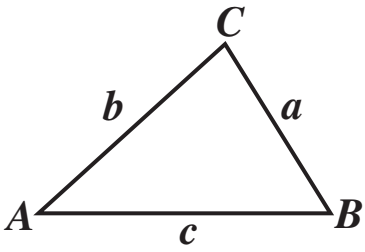


In any triangle ABC

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

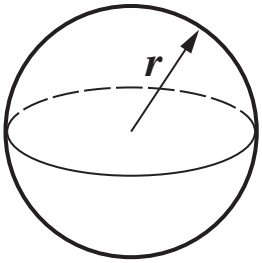
Cosine rule $a^2 = b^2 + c^2 - 2bc\cos A$

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



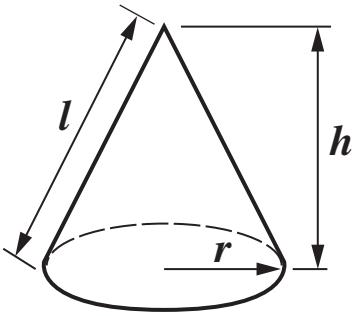
Volume of sphere $= \frac{4}{3}\pi r^3$

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



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

Curved surface area of cone $= \pi rl$



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?

(a) _____ ml

[1 mark]

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

Calculate how much lime cordial she needs.

(b) _____ ml

[2 marks]

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

Write the ratio 480 : 800 as simply as possible.

(c) _____ : _____

[2 marks]

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.

$5(3x - 4)$

(b) _____

[1 mark]

(c) Factorise fully.

$$6x + 3x^2$$

(c) _____

[2 marks]

3 Here are three consecutive integers.

n $n + 1$ $n + 2$

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

(a) _____

[1 mark]

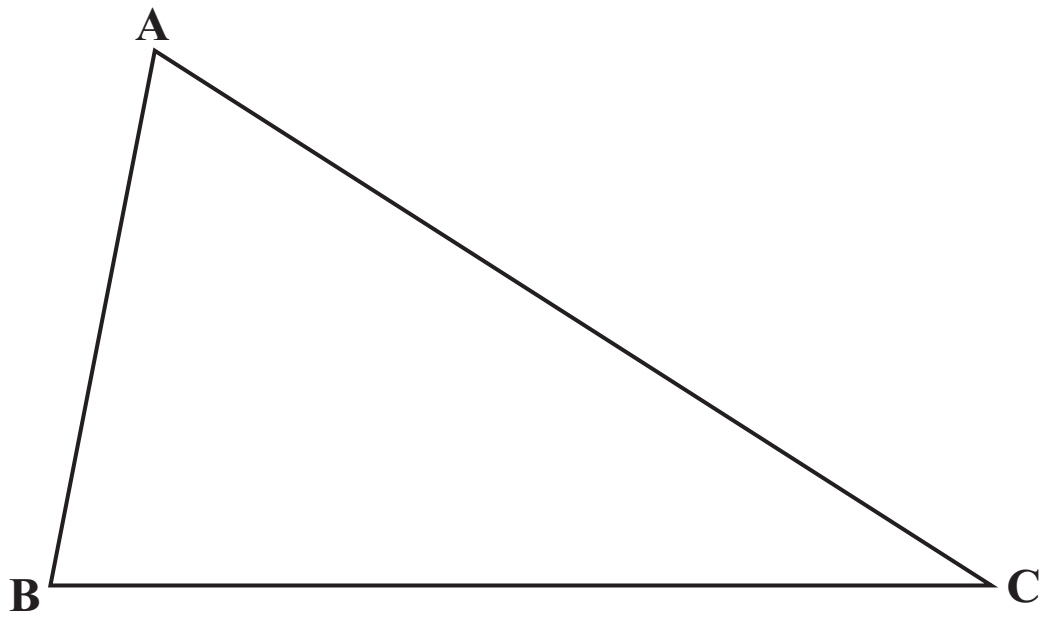
(b) Explain how you can tell from the answer to part (a) that the sum of three consecutive integers is <u>ALWAYS</u> divisible by 3.

_____

_____

[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.

(b) _____ cm

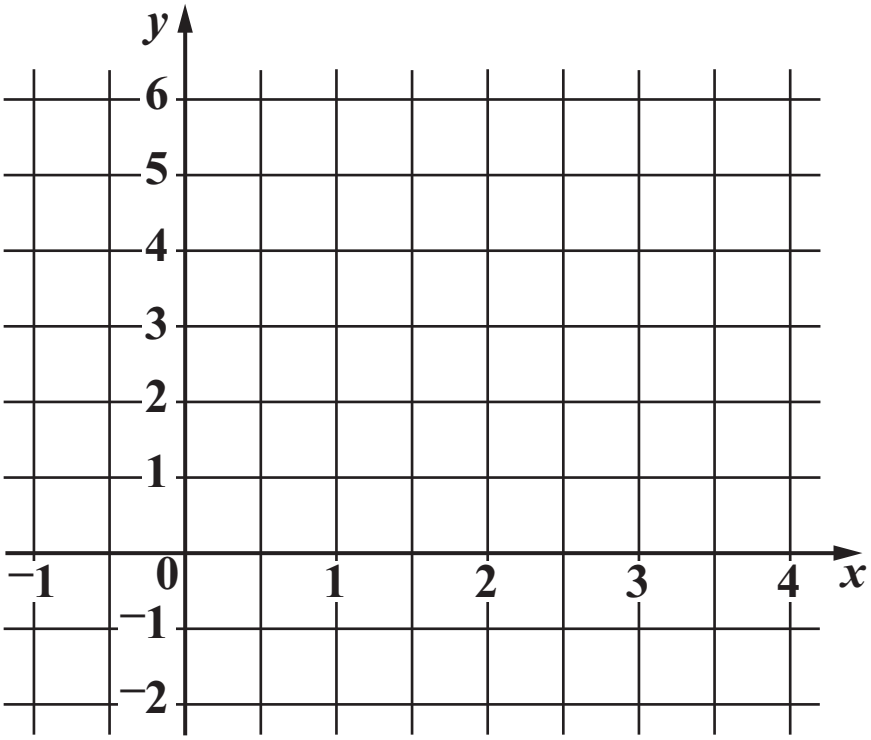
[1 mark]

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 $3 + 3x - x^2 = 0$.

(c) _____

[2 marks]

6 (a) Solve.

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

(a) _____

[3 marks]

(b) Simplify.

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

(b)(i) _____

[2 marks]

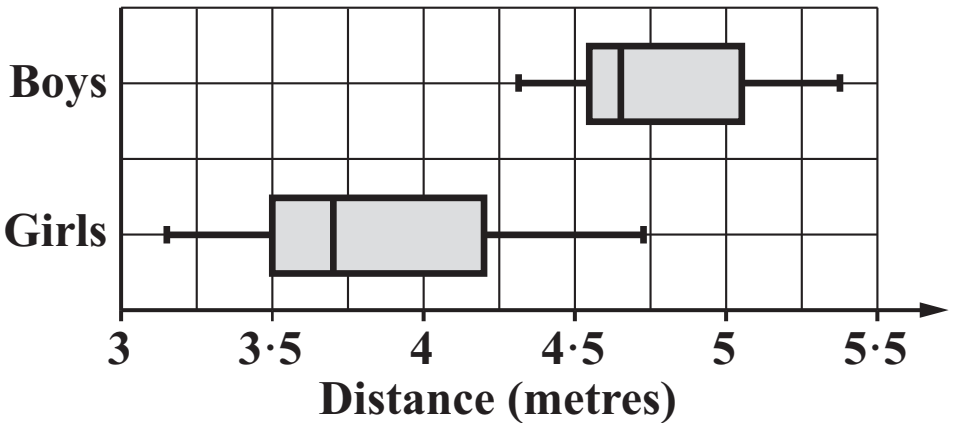
(ii) Simplify.

$(x^3)^4$

(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.

(b) _____ m

[2 marks]

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

1 _____

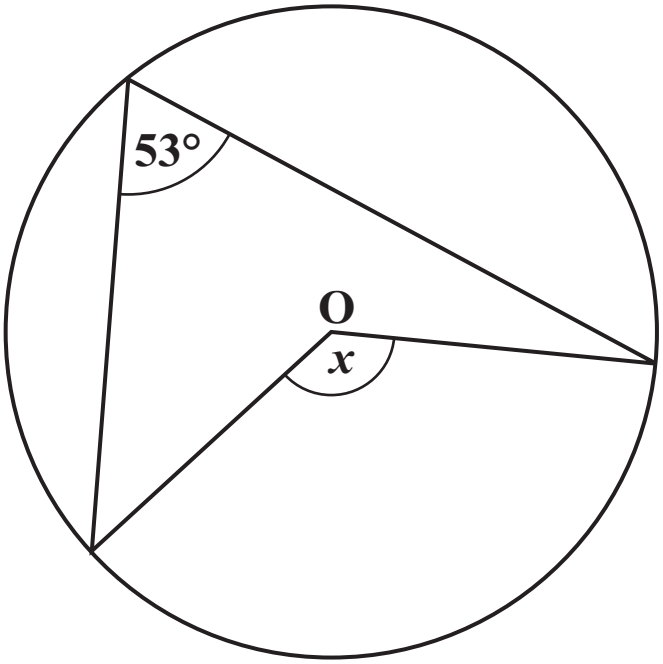
_____

2 _____

_____

[2 marks]

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



Not to scale

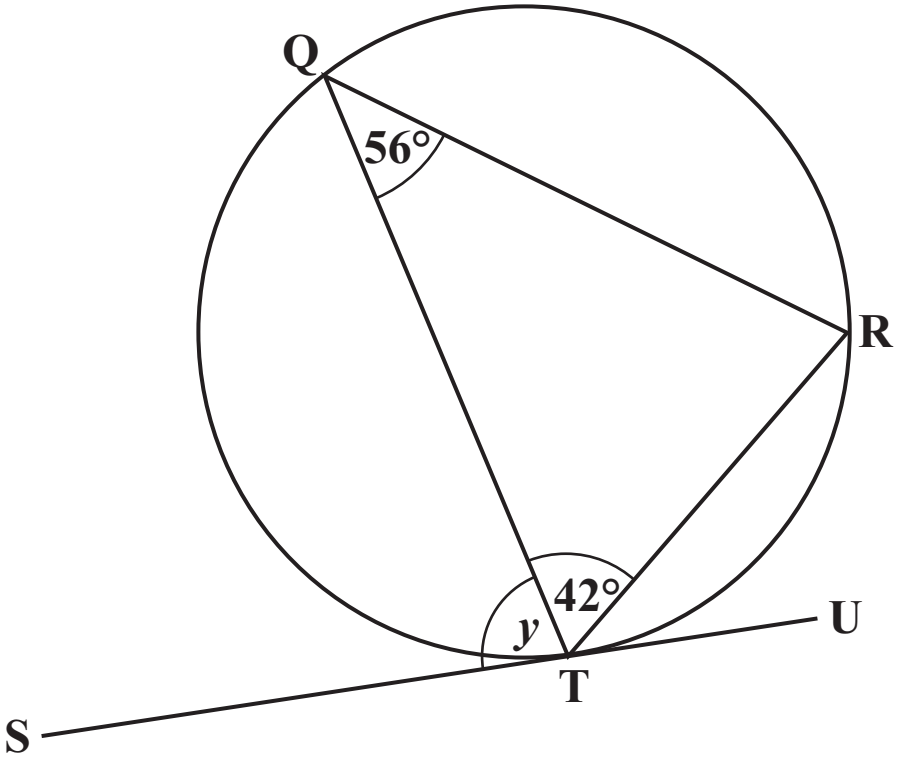
Find angle *x*, giving your reason.

x **= _____° because _____**

_____

[2 marks]

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



Not to scale

Find angle *y*, giving your reasons.

***y* = _____° because _____**

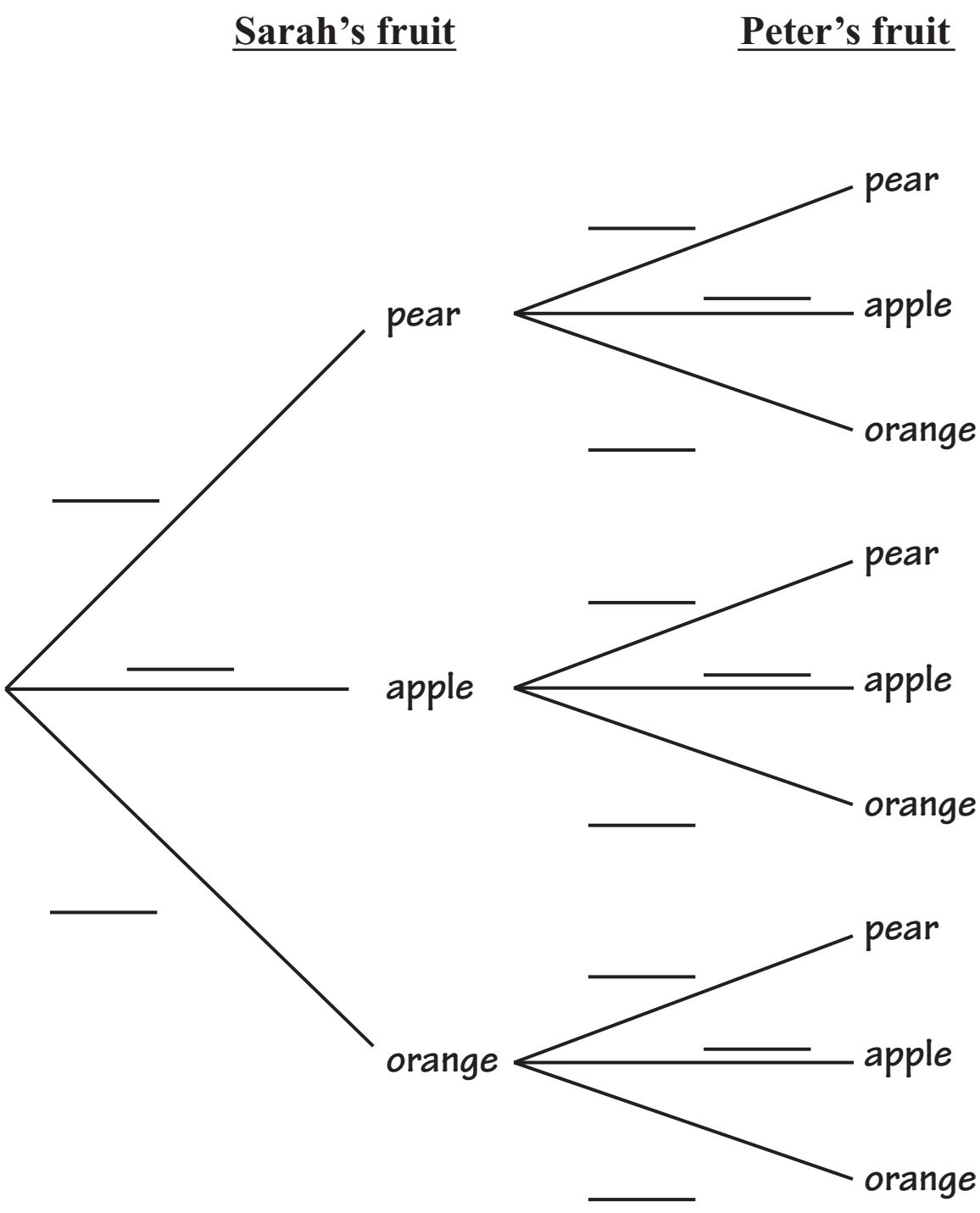
_____

_____

[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.

(b) _____

[2 marks]

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

(c) _____

[3 marks]

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

(_____ , _____) and (_____ , _____)

[5 marks]

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