

**GENERAL CERTIFICATE OF SECONDARY EDUCATION
MATHEMATICS C (GRADUATED ASSESSMENT)**

B282A

Terminal Paper – Section A
(Higher Tier)

Candidates answer on the question paper

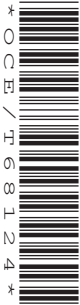
OCR Supplied Materials:
None

Other Materials Required:

- Geometrical instruments
- Tracing paper (optional)

**Monday 1 June 2009
Morning**

Duration: 1 hour



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

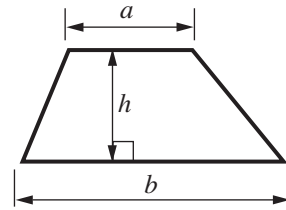
- The number of marks is given in brackets [] at the end of each question or part question.
- The total number of marks for this Section is **50**.
- This document consists of **12** pages. Any blank pages are indicated.

WARNING

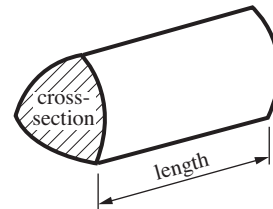
No calculator can be used for Section A of this paper

Formulae Sheet

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



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

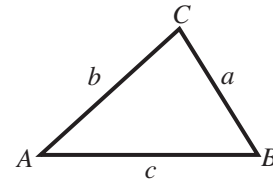


In any triangle ABC

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

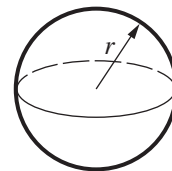
Cosine rule $a^2 = b^2 + c^2 - 2bc \cos A$

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



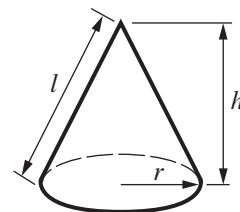
Volume of sphere = $\frac{4}{3}\pi r^3$

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

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

PLEASE DO NOT WRITE ON THIS PAGE

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]

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

Calculate how much lime cordial she needs.

(b) ml [2]

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

Write the ratio 480 : 800 as simply as possible.

(c) : [2]

- 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]

- (b) Expand.

$$5(3x - 4)$$

(b) [1]

- (c) Factorise fully.

$$6x + 3x^2$$

(c) [2]

3 Here are three consecutive integers.

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

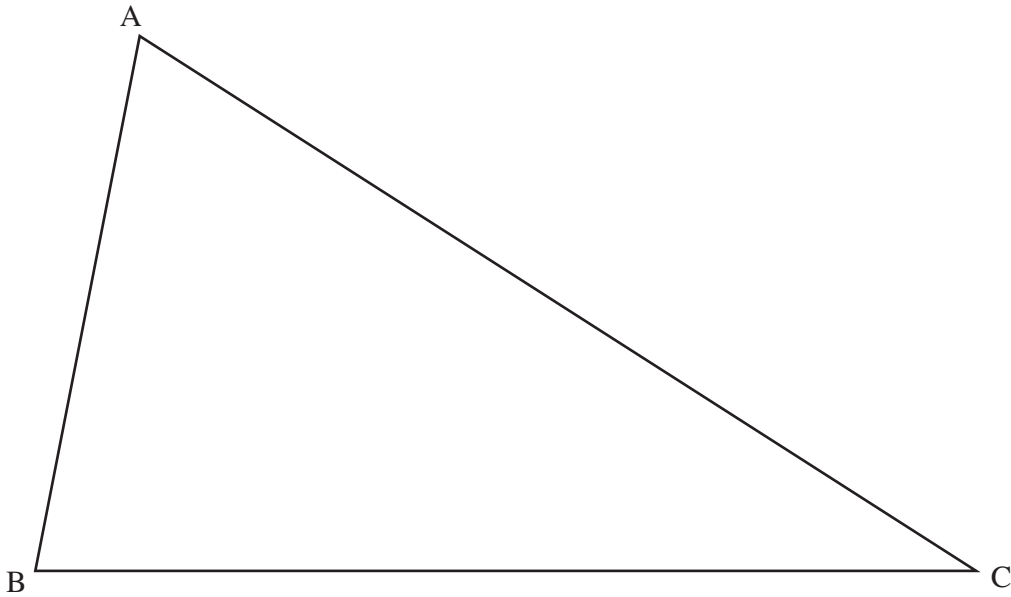
- (a) Find an expression for the sum of these three integers.
Write your answer as simply as possible.

(a) [1]

- (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]

4



- (a) Using ruler and compasses only, construct the bisector of angle ABC.
Leave in all your construction lines. [2]

- (b) The bisector of angle ABC intersects AC at D.
Measure AD.

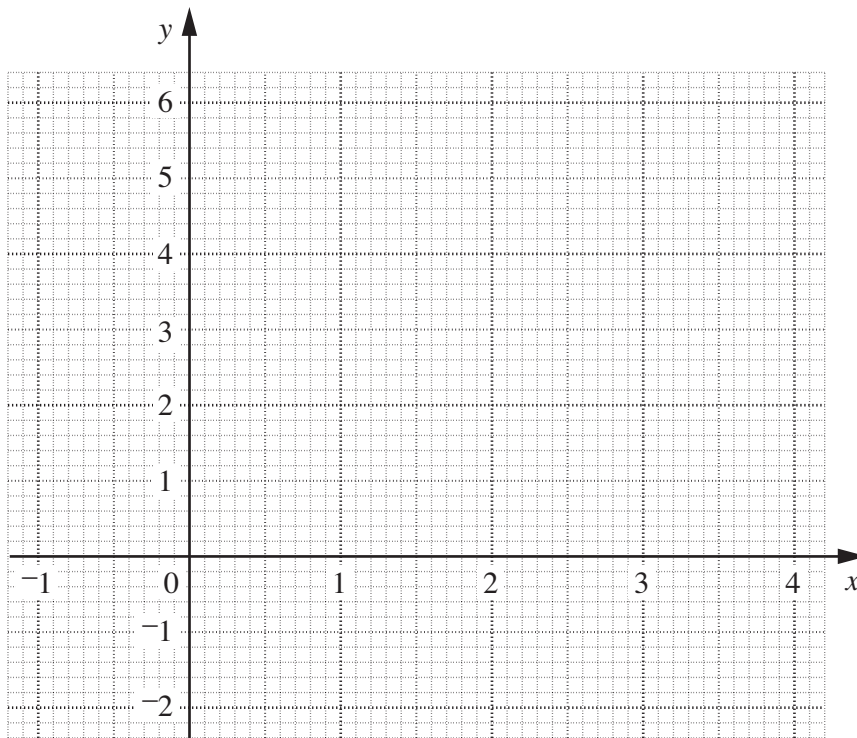
(b)cm [1]

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

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

[1]

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



[2]

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

(c) [2]

6 (a) Solve.

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

(a) [3]

(b) Simplify.

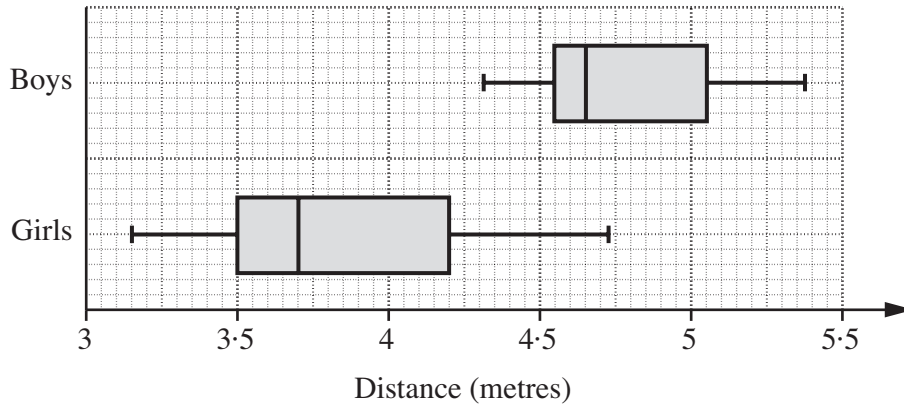
(i) $3a^2b \times 4a^3b$

(b)(i) [2]

(ii) $(x^3)^4$

(ii) [1]

- 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]

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

(b) m [2]

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

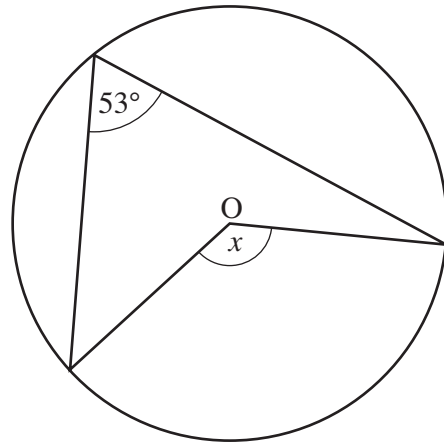
1

.....

2

..... [2]

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

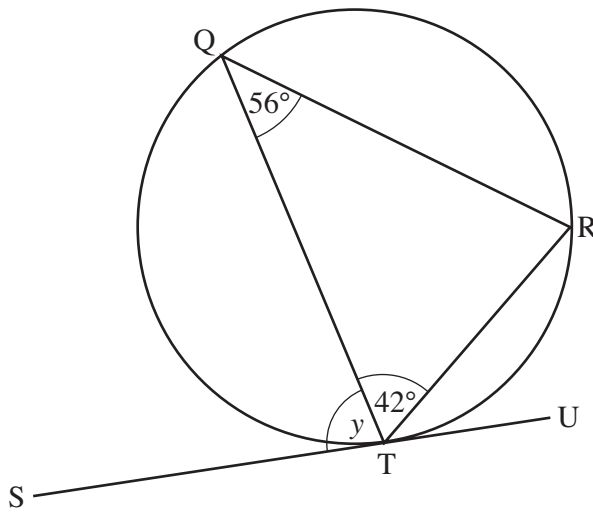


Not to scale

Find angle x , giving your reason.

$x = \dots\dots\dots^\circ$ because $\dots\dots\dots$
 $\dots\dots\dots$ [2]

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



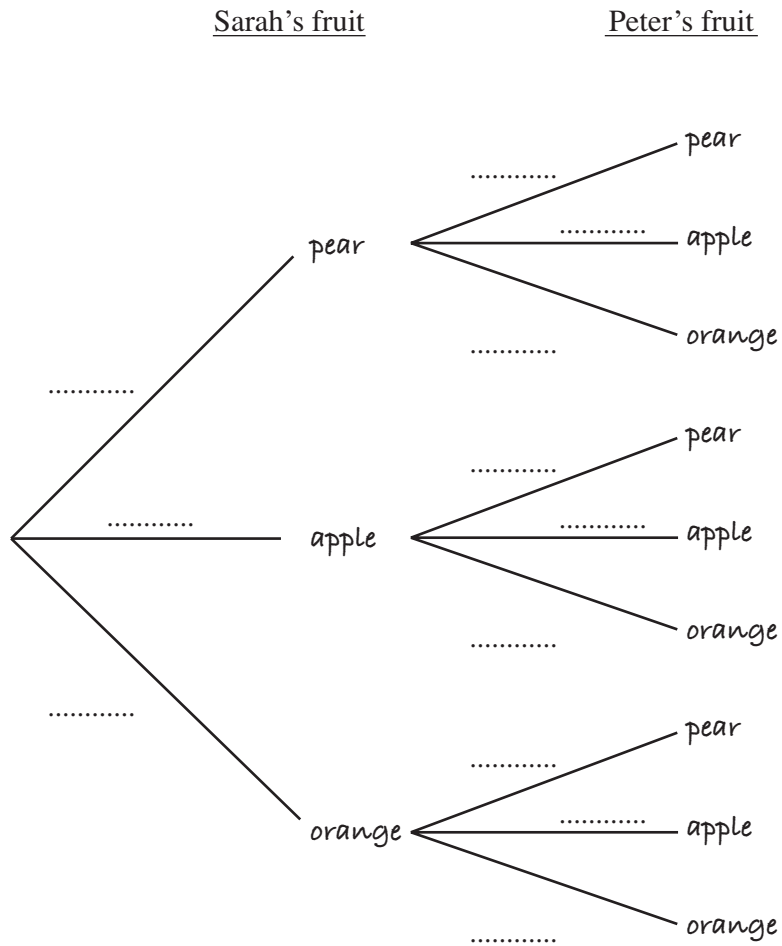
Not to scale

Find angle y , giving your reasons.

$y = \dots\dots\dots^\circ$ because $\dots\dots\dots$
 $\dots\dots\dots$
 $\dots\dots\dots$ [3]

- 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]

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

(b) [2]

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

(c) [3]

TURN OVER FOR QUESTION 10

- 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]



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