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OCR
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F

GENERAL CERTIFICATE OF SECONDARY EDUCATION

METHODS IN MATHEMATICS

B391/01

Methods in Mathematics 1 (Foundation Tier)

B31550111

Candidates answer on the question paper.

OCR supplied materials:
None

Other materials required:
- Geometrical instruments
- Tracing paper (optional)

Friday 14 January 2011
Morning

Duration: 1 hour

B391 01

Candidate forename		Candidate surname	

Centre number						Candidate number				

INSTRUCTIONS TO CANDIDATES

- Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Your answers should be supported with appropriate working. Marks may be given for a correct method even if the answer is incorrect.
- Write your answer to each question in the space provided. Additional paper may be used if necessary but you must clearly show your candidate number, centre number and question number(s).
- Answer **all** the questions.
- Do **not** write in the bar codes.

INFORMATION FOR CANDIDATES

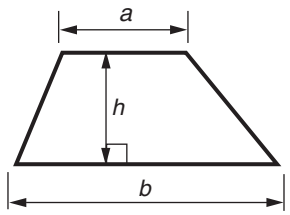
- The number of marks is given in brackets **[ ]** at the end of each question or part question.
- Your Quality of Written Communication is assessed in questions marked with an asterisk (*).
- The total number of marks for this paper is **60**.
- This document consists of **16** pages. Any blank pages are indicated.

WARNING
No calculator can be used for this paper

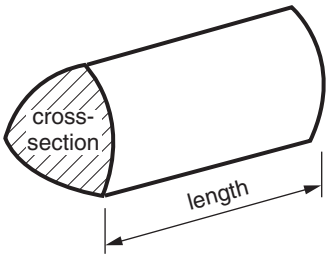
This paper has been pre modified for carrier language

Formulae Sheet: Foundation Tier

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



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



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1 An ordinary lorry can carry loads up to 44000 kilograms.

(a) Write 44000 in words.

_____ **[1]**

(b) Write 44000 kilograms in tonnes.
1000 kilograms = 1 tonne.

(b) _____ tonnes **[1]**

A specialist lorry can carry loads up to two hundred thousand kilograms.

(c) Write two hundred thousand in figures.

(c) _____ **[1]**

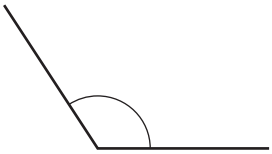
(d) **Estimate** how many ordinary lorries would be needed to carry the same load as the specialist lorry.

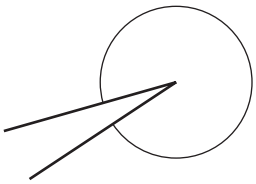
(d) _____ **[1]**

2 **(a)**

Obtuse	Right-angled	Reflex	Acute

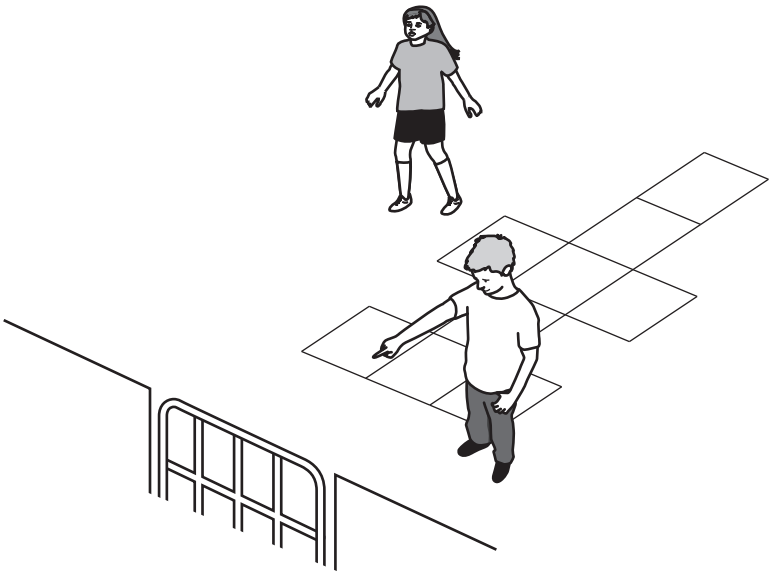
Describe each of the marked angles using words from the list.





_____ _____ _____ **[2]**

(b) This picture shows Douglas and Lucy in a playground.
Douglas is pointing at the gate.
Douglas turns and points at Lucy.



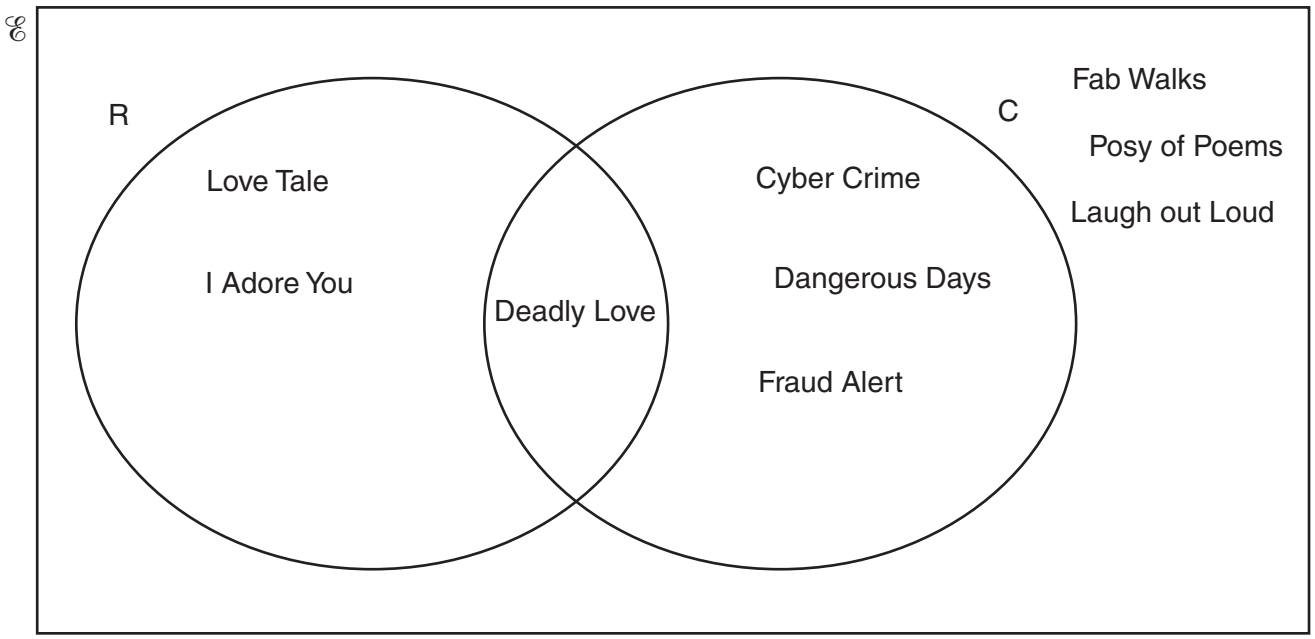
(i) Estimate the angle through which Douglas turns.

(b)(i) _____° **[1]**

(ii) Estimate another angle through which Douglas could have turned to point at Lucy.

(ii) _____° **[1]**

3 Abi has sorted her books and recorded their titles in a Venn diagram.
$\mathscr{E}$ represents Abi's books.
R represents her books that are about romance.
C represents her books that are about crime.



(a) Give the title of a book that is about

(i) both romance and crime,

(a)(i) _____ **[1]**

(ii) just crime,

(ii) _____ **[1]**

(iii) neither romance nor crime.

(iii) _____ **[1]**

(b) Describe the sorts of books represented by $R \cup C$.

_____ **[1]**

(c) Give the value of n(R).

(c) _____ **[1]**

4 Alfie and Bree play some games.
In each game they play, one person wins and the other loses.

(a) In the first game, Alfie has an evens chance of winning.

Describe, in a word, the chance that Bree wins this game.

(a) _____ **[1]**

(b) In the next game, Alfie is likely to win.

Describe, in a word, the chance that Bree wins this game.

(b) _____ **[1]**

(c) In another game, it is impossible for Alfie to win.

Describe, in a word, the chance that Bree wins this game.

(c) _____ **[1]**

(d) The probability that Alfie wins their final game is 0.3.

Work out the probability that Bree wins this game.

(d) _____ **[1]**

5* Javed has three planks of wood, each 150 cm long.
He has to cut pieces of the following lengths from them.

- one piece each of 8 cm, 60 cm, 71 cm, 83 cm and 139 cm

  and

- two pieces of 38 cm each

Work out a way that he could cut the planks.

Cut _____ from the first plank.

Cut _____ from the second plank.

Cut _____ from the third plank. **[4]**

6 Arrange these numbers in order of size, smallest first.

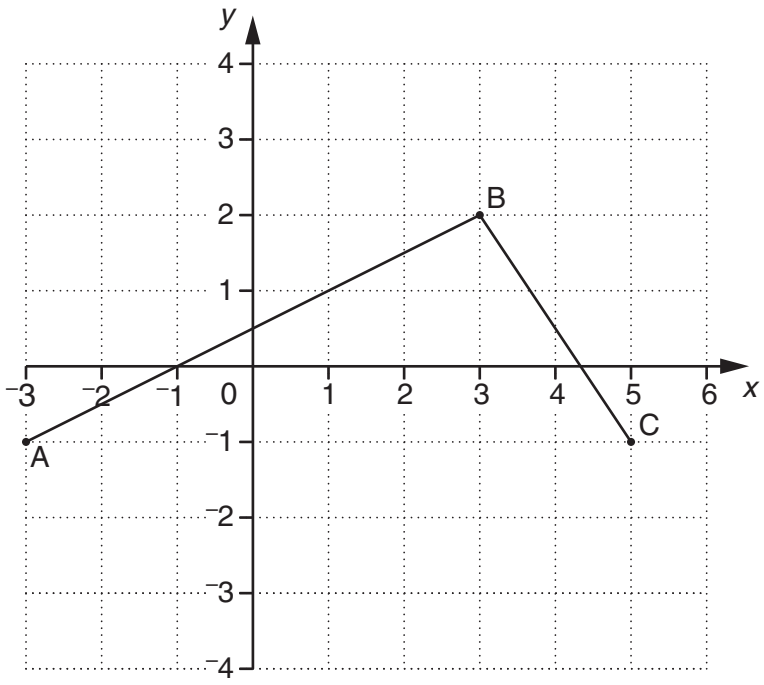
(a) 0.12, 0.2, 0.09, 0.102

(a) _____ , _____ , _____ , _____ **[2]**
smallest

(b) $\frac{3}{4}$, $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{2}$

(b) _____ , _____ , _____ , _____ **[2]**
smallest

7



(a) Write down the coordinates of

(i) B,

(a)(i) (_____ , _____) **[1]**

(ii) C.

(ii) (_____ , _____) **[1]**

(b) A, B, C and D are the corners of a kite.

Plot and label the point D on the grid. **[1]**

(c) Draw the line through C, parallel to line AB. **[1]**

8 Dionne and Eddie each have 140 square tiles.
Each tile measures 1 cm by 1 cm.

(a) Dionne decides to use all her 140 tiles to make one rectangle.
She wants her rectangle to have all its sides **longer** than 5 cm.

Give two possible sizes for Dionne's rectangle.

(a) _____ by _____

or _____ by _____ **[2]**

(b) Eddie decides to use some of his 140 tiles to make the largest square that he can.

(i) Give the length of the side of his square.

(b)(i) _____ cm **[1]**

(ii) Give the area of his square.

(ii) _____ cm^2 **[1]**

9

$^{-}5$	$^{-}3$	$^{-}2$	2	4	6	10

From these numbers, choose

(a) two that add up to 5,

(a) _____ and _____ **[1]**

(b) two that have a difference of 8 and when multiplied together give $^{-}12$.

(b) _____ and _____ **[2]**

10 Parcel delivery companies use a measure called volumetric weight.
The volumetric weight, V, of a parcel is calculated from the dimensions of a parcel, in cm, using this word formula.

To find V, multiply length by width by height and then divide by 8000.

(a) Write this formula for V in correct algebraic notation.
Use L for length, W for width and H for height.

(a) _____ **[3]**

(b) Find the volumetric weight for a parcel with length 40 cm, width 50 cm and height 80 cm.

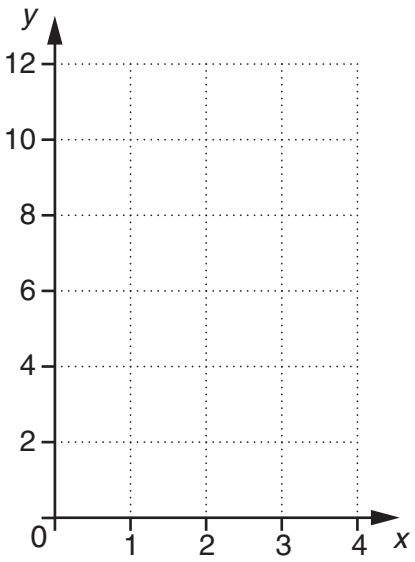
(b) _____ **[2]**

11 **(a)** Complete the table for $y = 2x + 3$.

x	0	2	4
y	3		

[1]

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



[2]

12 Ged throws two fair dice.
One dice is red and one is blue.
Each dice has the numbers 1 to 6 on it.

Ged's score is the positive **difference** between the two numbers that are thrown.

(a) Complete the table below to show the possible scores.

	Number on Red Dice						
Number on Blue Dice		**1**	**2**	**3**	**4**	**5**	**6**
	1				3		
	2						4
	3						
	4	3					
	5						
	6		4				

[2]

(b) On his next throw,

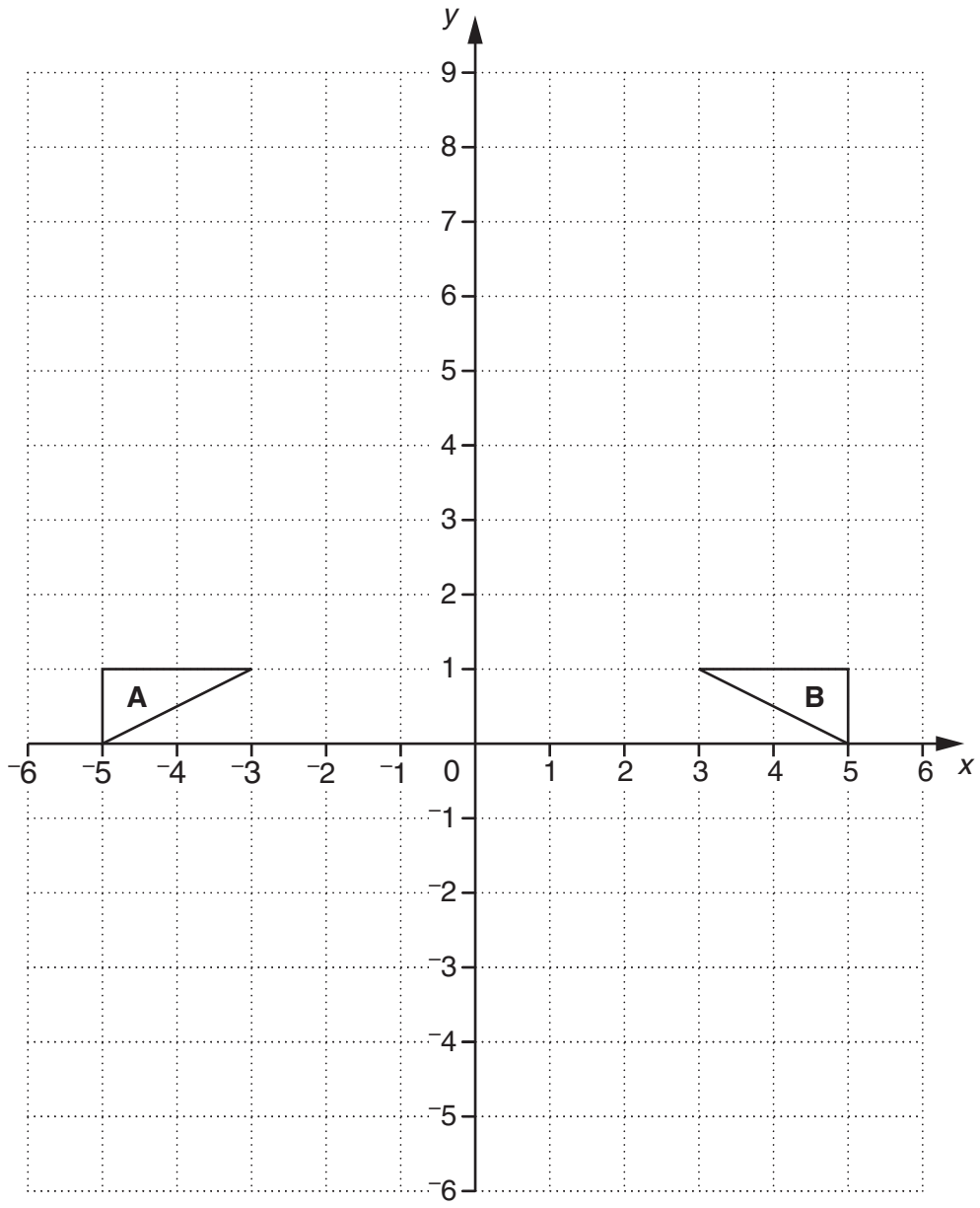
(i) find the probability that Ged scores 2.

(b)(i) _____ **[1]**

(ii) find the probability that Ged scores an odd number.

(ii) _____ **[2]**

13



(a) Describe fully the **single** transformation which maps triangle **A** onto triangle **B**.

_____

_____ **[2]**

(b) Enlarge triangle **B** using scale factor 3 and centre (6, 2). **[3]**

14 **(a)** Simplify.

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

(a) _____ **[3]**

(b) Simplify.

(i) $(x^3)^2$

(b)(i) _____ **[1]**

(ii) $\dfrac{a^3 \times a^4}{a^2}$

(ii) _____ **[2]**

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