

**OXFORD CAMBRIDGE AND RSA EXAMINATIONS**  
**General Certificate of Secondary Education**  
**MATHEMATICS SYLLABUS A**

**1962/4**

PAPER 4 (Intermediate Tier)

Monday **12 JUNE 2006** Morning 2 hours

Candidates answer on the question paper.

Additional materials:

- Electronic Calculator
- Geometrical instruments
- Tracing paper (optional)

Candidate Name	Centre Number	Candidate Number												
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**TIME** 2 hours

**INSTRUCTIONS TO CANDIDATES**

- Write your name in the space above.
- Write your Centre number and candidate number in the boxes above.
- Answer **all** the questions.
- Write your answers, in blue or black ink, in the spaces provided on the question paper.
- Read each question carefully and make sure you know what you have to do before starting your answer.
- Show your working. Marks may be given for working that shows that you know how to solve the problem even if you get the answer wrong.
- You are expected to use an electronic calculator for this paper.

**INFORMATION FOR CANDIDATES**

- The number of marks is given in brackets [ ] at the end of each question or part question.
- Unless otherwise instructed in the question, take  $\pi$  to be 3.142 or use the  $\pi$  button on your calculator.

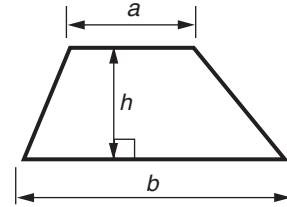
<b>FOR EXAMINER'S USE</b>

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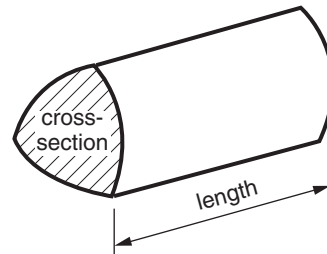
**This question paper consists of 18 printed pages and 2 blank pages.**

## Formulae Sheet: Intermediate Tier

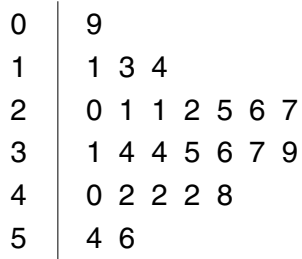
**Area of trapezium** =  $\frac{1}{2}(a + b)h$



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



1 The weights of 25 dogs are shown in the stem and leaf diagram below.



5 | 4 represents 5.4 kg

(a) Write down the weight of the heaviest dog.

(a) \_\_\_\_\_ kg [1]

(b) Work out the range.

.....

(b) \_\_\_\_\_ kg [1]

(c) Find the median.

.....

.....

(c) \_\_\_\_\_ kg [1]

2 Here are the first five terms of a sequence.

**8, 11, 14, 17, 20**

Work out the 11th term of the sequence. Explain how you worked out your answer.

.....

.....

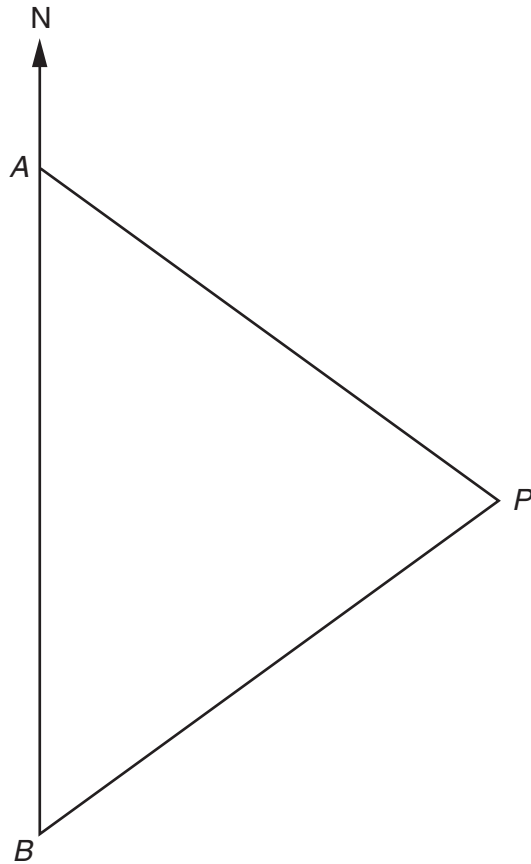
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11th term is \_\_\_\_\_ because \_\_\_\_\_

\_\_\_\_\_ [2]

- 3 The diagram below shows the positions of Anna's house ( $A$ ), Bryn's house ( $B$ ) and a post-box ( $P$ ).  
Anna's house is due North of Bryn's house.  
The scale of the diagram is 1 cm to 50 m.



- (a) Find the distance, in metres, between Bryn's house and the post-box.

.....  
.....

(a) \_\_\_\_\_ m [2]

- (b) Measure the bearing of the post-box from Anna's house.

(b) \_\_\_\_\_ ° [1]

- (c) Clare's house is 200 m due East of Anna's house.

Mark a point C on the diagram to show the position of Clare's house. [2]

4 (a)



Hannah's height is 56% of the height of the door. The height of the door is 1.95 m.

Calculate Hannah's height.

.....  
 .....

(a) \_\_\_\_\_ m [2]

(b) Calculate the value of this expression.

$$\frac{7}{(0.5)^2}$$

.....

(b) \_\_\_\_\_ [2]

(c) Put one pair of brackets into each calculation to make the answer correct.

(i)  $10 + 5 \times 4 - 2 = 58$

.....

(c)(i)  $10 + 5 \times 4 - 2 = 58$  [1]

(ii)  $10 + 5 \times 4 - 2 = 20$

.....

(ii)  $10 + 5 \times 4 - 2 = 20$  [1]

5 (a) Solve.

(i)  $\frac{x}{4} = 9$

.....

(a)(i) \_\_\_\_\_ [1]

(ii)  $2x + 5 = 12$

.....

(ii) \_\_\_\_\_ [2]

(b) Simplify completely.

$$7x - 3y + 9x - 2y$$

.....

(b) \_\_\_\_\_ [2]

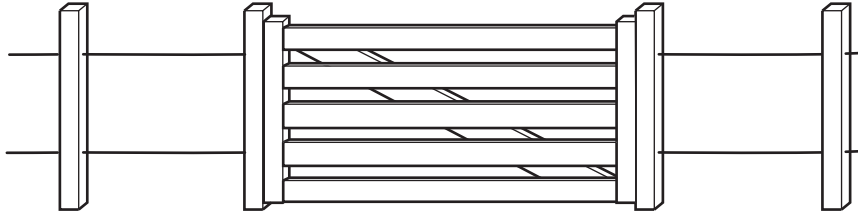
(c) Multiply out.

$$5(x + 3)$$

.....

(c) \_\_\_\_\_ [1]

6



Farmer Giles is putting a new gate and fence on one side of a field.

(a) Work out the three missing values in this bill.

.....

.....

.....

.....

<b>FENCE MATERIALS</b>		
18 posts	@ £2.63 per post	£.....
..... m of wire	@ £1.25 per metre	£.....
<b>Total cost</b>		<b>£ 116.09</b>

[4]

(b) Farmer Giles can buy a wooden gate or a metal gate.

A wooden gate costs £125 including VAT.

A metal gate costs £114 plus VAT.

The rate of VAT is 17.5 %.

How much cheaper is a wooden gate than a metal gate?

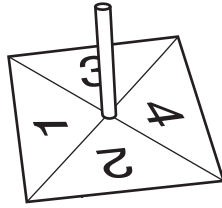
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(b) £ \_\_\_\_\_ [3]

7 (a)



Liam and Jack each did an experiment with this spinner.  
The table shows the number of times that each of them scored 1, 2, 3 and 4.

Score	1	2	3	4
Liam	3	6	4	7
Jack	21	24	30	25

- (i) Whose results would you use to estimate the probability that the next time the spinner is spun the score will be 1? Explain how you decided.

\_\_\_\_\_ because \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_ [1]

- (ii) Use your answer from part (i) to estimate the probability that the next score will be 1.

.....  
 .....

(a)(ii) \_\_\_\_\_ [2]

(b)



Katy throws a fair six-sided dice 480 times.

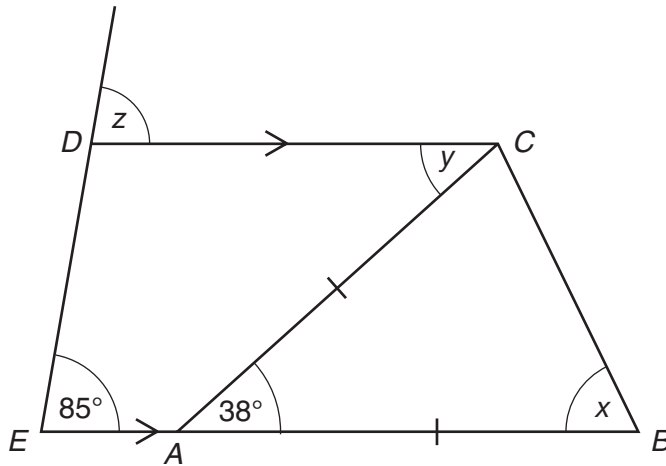
How many times should she expect to score a 3?

.....  
 .....

(b) \_\_\_\_\_ [2]



8



NOT TO  
SCALE

In the diagram,  $AB = AC$ .

(a) Work out angle  $x$ .

.....  
 .....  
 .....

(a)  $x =$  \_\_\_\_\_  $^{\circ}$  [2]

(b)  $EAB$  is a straight line parallel to  $DC$ .

(i) Find angle  $y$ . Give a reason for your answer.

.....  
 .....  
 $y =$  \_\_\_\_\_  $^{\circ}$  because \_\_\_\_\_  
 \_\_\_\_\_ [2]

(ii) Find angle  $z$ . Give a reason for your answer.

.....  
 .....  
 $z =$  \_\_\_\_\_  $^{\circ}$  because \_\_\_\_\_  
 \_\_\_\_\_ [2]

9 (a) Solve.

$$2(x - 7) = 20$$

.....  
 .....

(a) \_\_\_\_\_ [3]

(b) Factorise.

(i)  $3t - 12$

.....

(b)(i) \_\_\_\_\_ [1]

(ii)  $x^2 + 5x$

.....

(ii) \_\_\_\_\_ [1]

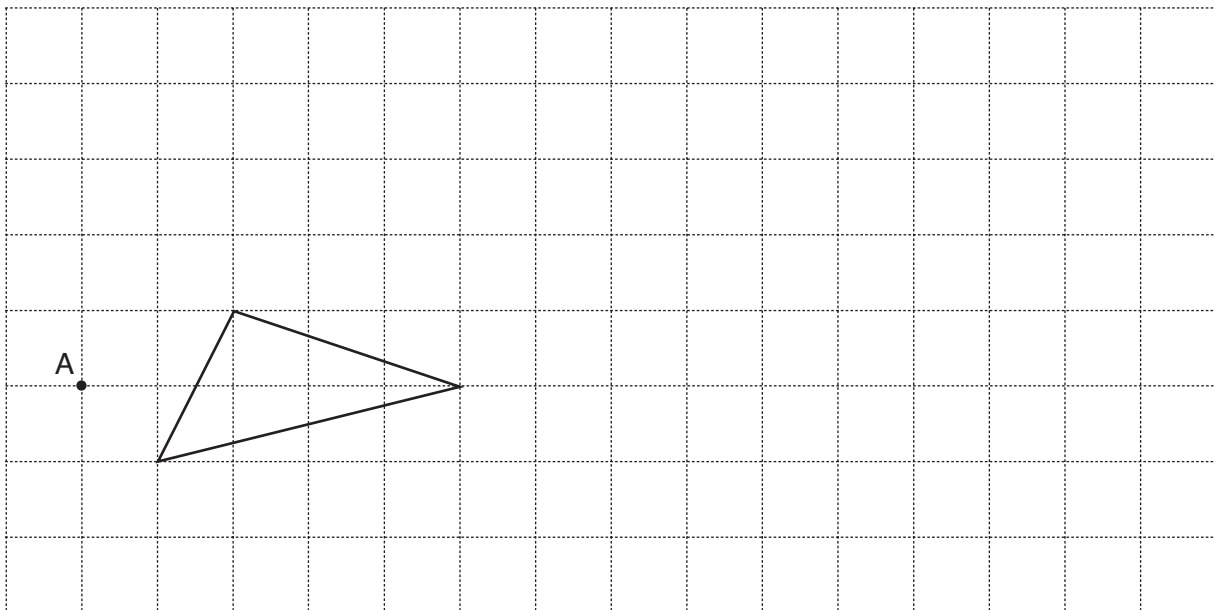
(c) Rearrange this formula to make  $x$  the subject.

$$y = 5x - 2$$

.....  
 .....

(c) \_\_\_\_\_ [2]

10 On the grid, enlarge the triangle from centre A by scale factor 2.



[3]

11 Use your calculator to work these out.

(a)  $\frac{5 \times 3.7}{4.24 + 1.08}$

Give your answer correct to two decimal places.

.....

(a) \_\_\_\_\_ [2]

(b)  $\sqrt{\frac{100}{2.7^3}}$

Give your answer correct to two significant figures.

.....

(b) \_\_\_\_\_ [2]

(c)  $5\frac{3}{5} \div 1\frac{3}{4}$

Give your answer as a fraction.

.....

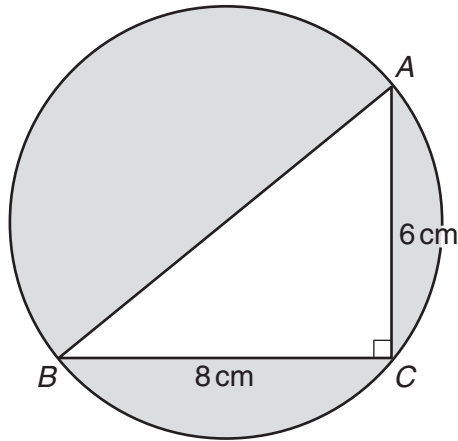
(c) \_\_\_\_\_ [2]

(d)  $(5.4 \times 10^8) + (6.2 \times 10^9)$

Give your answer in standard form.

.....

(d) \_\_\_\_\_ [2]



NOT TO  
SCALE

The diagram shows a circle, radius 5 cm, passing through points  $A$ ,  $B$  and  $C$ .  
 $AC = 6$  cm,  $BC = 8$  cm and angle  $C = 90^\circ$ .

- (a) Calculate the total shaded area.  
Give the units of your answer.

.....

.....

.....

.....

.....

(a) \_\_\_\_\_ [6]

- (b) Explain how you can tell that  $AB$  is the diameter of the circle.

.....

.....

$AB$  is the diameter because \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_ [2]

13 (a) In 2004 Cameron and Emma bought a total of 72 magazines.

(i) Cameron and Emma bought the magazines in the ratio 5 : 7.

How many did Emma buy?

.....  
.....  
.....

(a)(i) \_\_\_\_\_ [2]

(ii) In 2005 Cameron and Emma bought a total of 85 magazines.

Calculate the percentage increase from 72 to 85.

.....  
.....  
.....

(ii) \_\_\_\_\_ % [3]

(b) The library held a book sale.  
One book was sold for £6.15.  
This was a reduction of 70% of the original price.

What was the original price of the book?

.....  
.....  
.....

(b) £ \_\_\_\_\_ [3]

14 Use trial and improvement to find the value of  $x$  correct to **one** decimal place when

$$x^3 - 4x = 24.$$

You must show all your trials and their outcomes.

.....

.....

.....

.....

.....

.....

.....

.....

\_\_\_\_\_ [4]

15 (a) Hassan measured the heights of 80 boys from Year 11.  
His results are summarised in the table below.

Height ( $h$ cm )	Frequency
$150 < h \leq 160$	8
$160 < h \leq 170$	40
$170 < h \leq 180$	28
$180 < h \leq 190$	4

Calculate an estimate of the mean height.

.....

.....

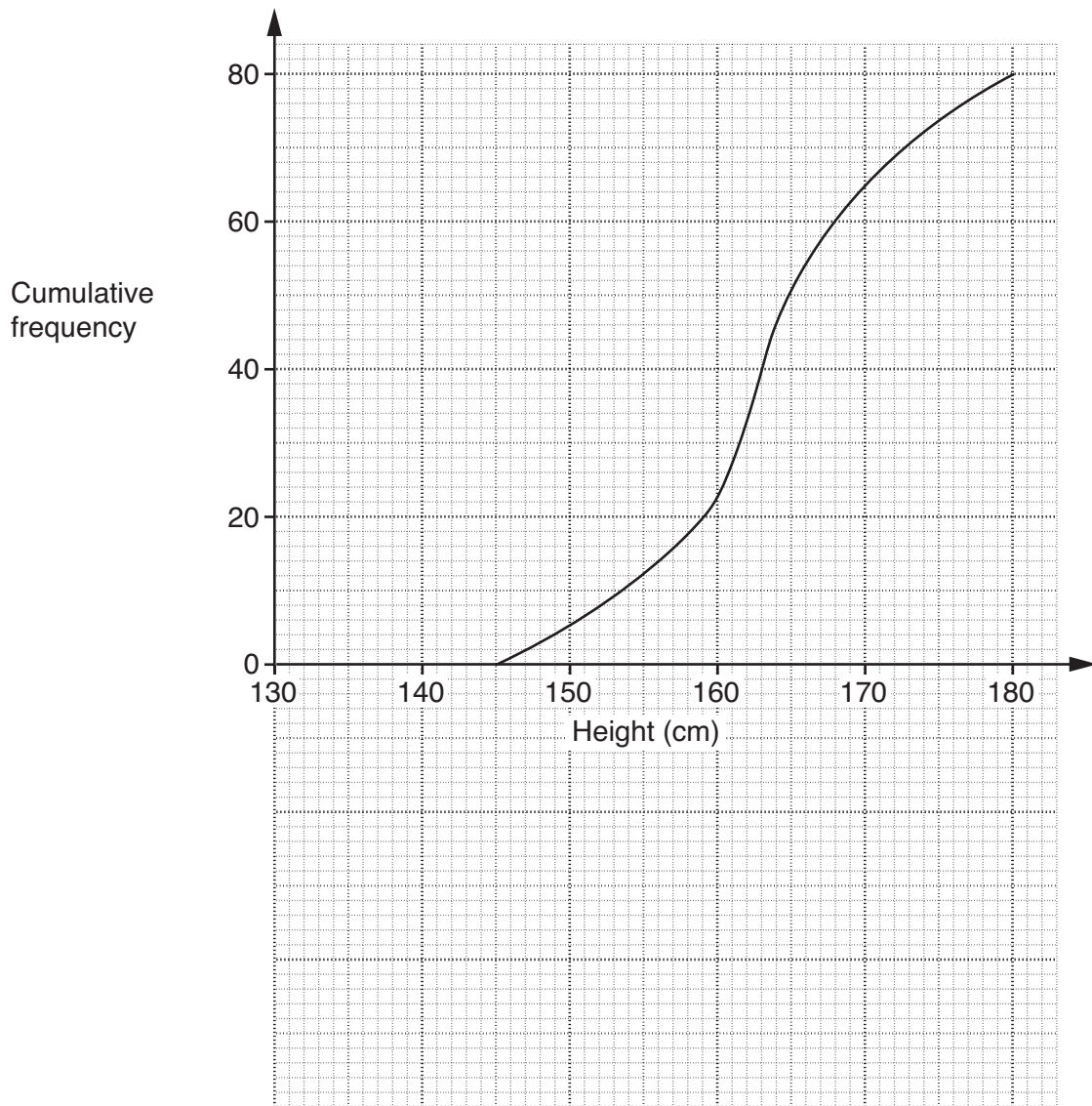
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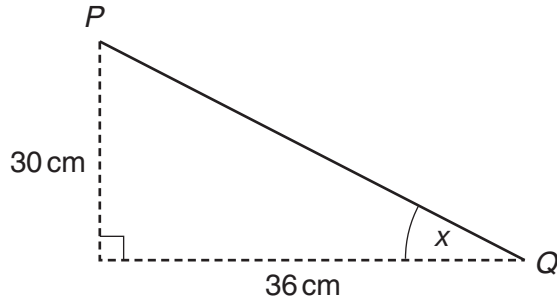
(a) \_\_\_\_\_ cm [4]

(b) The cumulative frequency diagram below shows the heights of 80 girls from Year 11.



On the grid, below the cumulative frequency diagram, draw a box plot to illustrate the distribution of the heights of the girls. [3]

16 (a)



NOT TO  
SCALE

A handrail,  $PQ$ , makes an angle  $x$  with the horizontal.

Calculate angle  $x$ .

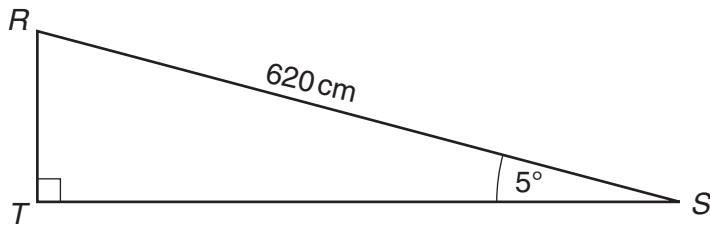
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(a) \_\_\_\_\_° [3]

(b)



NOT TO  
SCALE

Some steps are replaced by a ramp,  $RS$ .

The ramp measures 620 cm and makes an angle of  $5^\circ$  with the horizontal.

Calculate  $RT$ .

.....

.....

.....

.....

(b) \_\_\_\_\_ cm [3]



17 (a) Solve this inequality.

$$8x < 6x + 5$$

.....

(a) \_\_\_\_\_ [2]

(b) (i) Factorise.

$$x^2 - 7x - 8$$

.....

.....

(b)(i) \_\_\_\_\_ [2]

(ii) Hence solve.

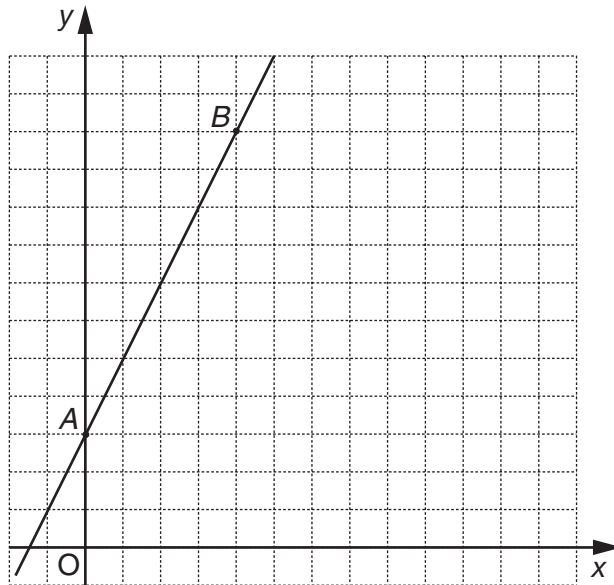
$$x^2 - 7x - 8 = 0$$

.....

.....

(ii) \_\_\_\_\_ [1]

18



A straight line is drawn through the points  $A ( 0, 3 )$  and  $B ( 4, 11 )$ .

(a) (i) Work out the gradient of  $AB$ .

.....  
 .....

(a)(i) \_\_\_\_\_ [2]

(ii) Write down the equation of the line  $AB$ .

(ii) \_\_\_\_\_ [1]

(b) Write down the equation of the line parallel to  $AB$  which passes through the point  $(0, 0)$ .

.....

(b) \_\_\_\_\_ [1]



