

Centre No.						Paper Reference						Surname	Initial(s)	
Candidate No.						5	5	2	3	/	0	3	Signature	

Paper Reference(s)

**5523/03**

**Edexcel GCSE**

**Mathematics A – 1387**

Paper 3 (Non-Calculator)

**Intermediate Tier**

Monday 5 June 2006 – Afternoon

Time: 2 hours

Examiner's use only

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Team Leader's use only

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ND003474140

**Materials required for examination**

Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser.  
Tracing paper may be used.

**Items included with question papers**

Nil

**Instructions to Candidates**

In the boxes above, write your centre number, candidate number, your surname, initials and signature. Check that you have the correct question paper.

Answer ALL the questions in the spaces provided in this question paper.

**You must NOT write on the formulae page. Anything you write on the formulae page will gain NO credit.**

If you need more space to complete your answer to any question, use additional answer sheets.

**Information for Candidates**

The marks for individual questions and the parts of questions are shown in round brackets: e.g. (2).

There are 27 questions in this question paper. The total mark for this paper is 100.

There are 24 pages in this question paper. Any blank pages are indicated.

**Calculators must not be used.**

**Advice to Candidates**

Show all stages in any calculations.

Work steadily through the paper. Do not spend too long on one question.

If you cannot answer a question, leave it and attempt the next one.

Return at the end to those you have left out.

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*Turn over*

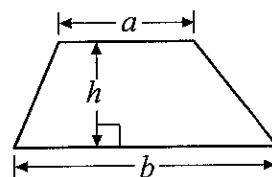
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GCSE Mathematics 1387/8

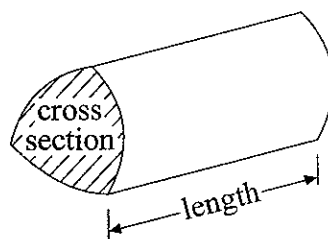
Formulae: Intermediate Tier

**You must not write on this formulae page.  
Anything you write on this formulae page will gain NO credit.**

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



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



Answer ALL TWENTY SEVEN questions.

Write your answers in the spaces provided.

You must write down all stages in your working.

You must NOT use a calculator.

1. The two-way table gives some information about the lunch arrangements of 85 students.

	School lunch	Packed lunch	Other	Total
Female	21		13	47
Male		5		
Total	40			85

Complete the two-way table.

Q1

(Total 3 marks)

2.  $S = 2p + 3q$

$p = -4$

$q = 5$

- (a) Work out the value of  $S$ .

$S = \dots\dots\dots$   
(2)

$T = 2m + 30$

$T = 40$

- (b) Work out the value of  $m$ .

$m = \dots\dots\dots$   
(2)

(Total 4 marks)

Q2



3. A train travels from London to Manchester.

It leaves London at 16 55

It arrives in Manchester at 19 45

(a) Work out the number of minutes this train takes to travel from London to Manchester.

..... minutes

(3)

There are 800 people on the train at Manchester.

$\frac{1}{10}$  of these 800 people are children

(b) (i) Work out  $\frac{1}{10}$  of 800

.....

$\frac{3}{8}$  of these 800 people are women.

(ii) Work out  $\frac{3}{8}$  of 800

.....

The rest of the 800 people are men.

(iii) Work out the number of men on the train.

.....

(4)

320 out of the 800 people are under 21 years old.

(c) Work out 320 out of 800 as a percentage.

..... %

(2)

(Total 9 marks)

Q3



4.

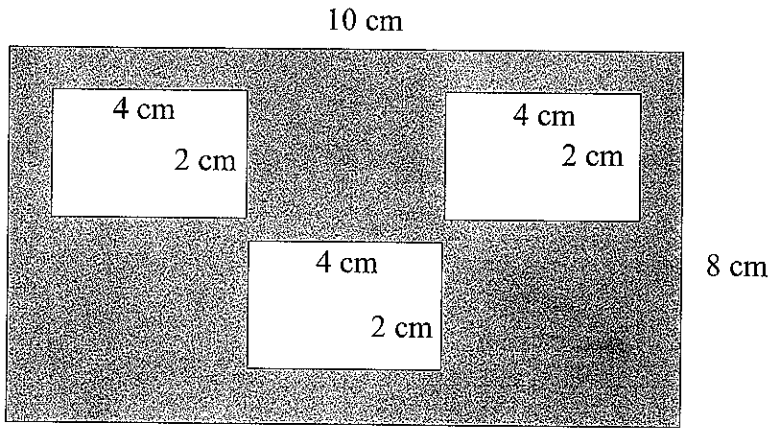


Diagram NOT accurately drawn

The diagram shows 3 small rectangles inside a large rectangle.  
 The large rectangle is 10 cm by 8 cm.  
 Each of the 3 small rectangles is 4 cm by 2 cm.

Work out the area of the region shown shaded in the diagram.

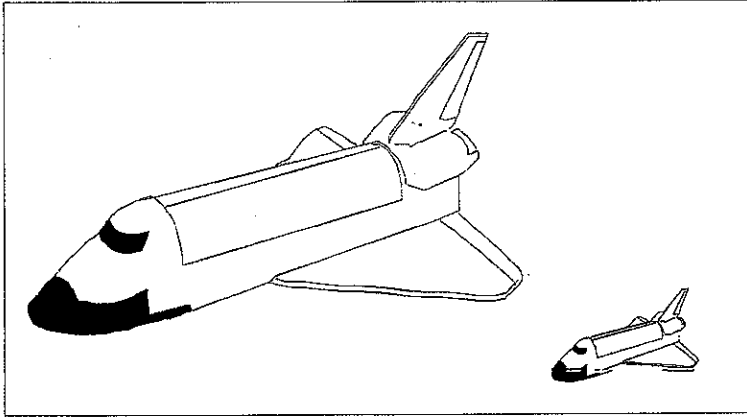
..... cm<sup>2</sup>

(Total 3 marks)

Q4



5.



Picture NOT accurately drawn

A model of a space shuttle is made to a scale of 2 centimetres to 1 metre.

The length of the space shuttle is 24 metres.

- (a) Work out the length of the model.  
Give your answer in centimetres.

..... cm  
(2)

The height of the model is 10 centimetres.

- (b) Work out the height of the space shuttle.  
Give your answer in metres.

..... m  
(2)

(Total 4 marks)

Q5



6. Use the information that

$$257 \times 34 = 8738$$

to find the value of

(a)  $2.57 \times 34$

..... (1)

(b)  $873.8 \div 2.57$

..... (1)

**(Total 2 marks)**

Q6

7. Work out  $\frac{2}{3} + \frac{1}{5}$

.....

**(Total 2 marks)**

Q7



8.

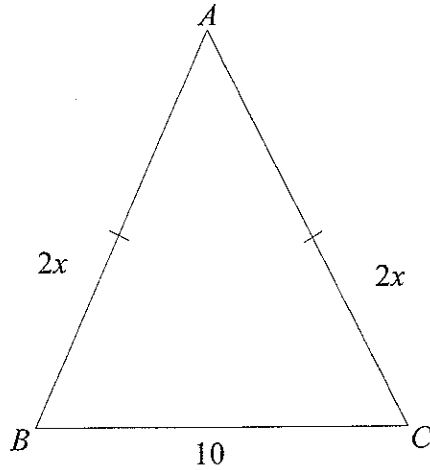


Diagram NOT accurately drawn

In the diagram, all measurements are in centimetres.

$ABC$  is an isosceles triangle.

$$AB = 2x$$

$$AC = 2x$$

$$BC = 10$$

- (a) Find an expression, in terms of  $x$ , for the **perimeter** of the triangle.  
Simplify your expression.

.....  
(2)

The perimeter of the triangle is 34 cm.

- (b) Find the value of  $x$ .

$x =$  .....  
(2)

(Total 4 marks)

Q8



9. The table shows some rows of a number pattern.

Row 1	$2^2 - 0^2 = 4 = 4 \times 1$
Row 2	$3^2 - 1^2 = 8 = 4 \times 2$
Row 3	$4^2 - 2^2 = 12 = 4 \times 3$
Row 4	

(a) Complete Row 4 of the number pattern.

(1)

(b) Use the number pattern to find the answer to  $121^2 - 119^2$

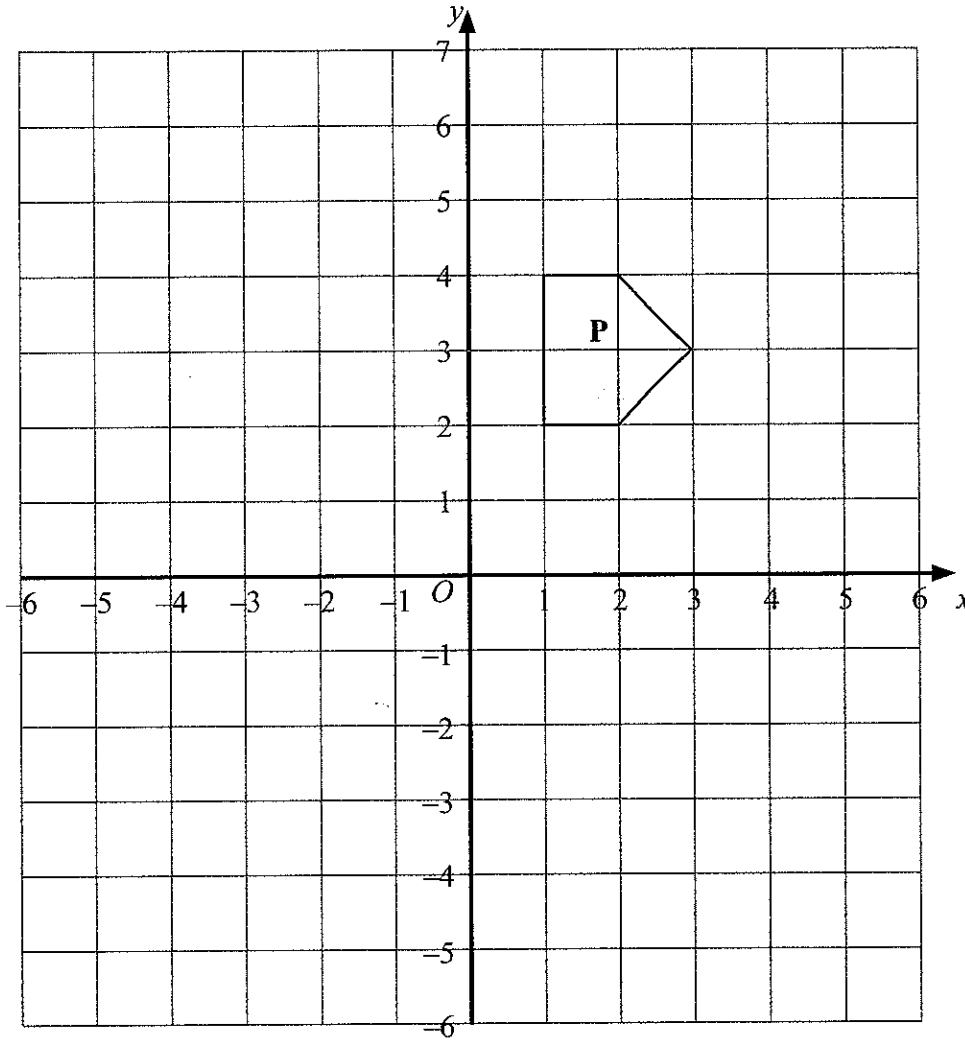
.....  
(2)

(Total 3 marks)

Q9



10.



On the grid, rotate the shaded shape **P** one quarter turn anticlockwise about *O*.

Label the new shape **Q**.

(Total 3 marks)

Q10

11. An aeroplane flies from Liverpool to Prague, a distance of 1200 km.  
The aeroplane takes 4 hours.

Work out the average speed of the aeroplane.  
State the units of your answer.

.....

(Total 3 marks)

Q11



12. (a) Solve  $4x + 3 = 19$

$x = \dots\dots\dots$   
(2)

(b) Solve  $4y + 1 = 2y + 8$

$y = \dots\dots\dots$   
(2)

(c) Simplify  $2(t + 5) + 13$

$\dots\dots\dots$   
(2)

Q12

(Total 6 marks)



13.  $3x^2 = 108$

(a) Find a value of  $x$

$x = \dots\dots\dots$

(2)

(b) Express 108 as a product of its prime factors.

$\dots\dots\dots$   
(3)

(Total 5 marks)

Q13

14. A silver chain has a volume of  $5 \text{ cm}^3$ .  
The density of silver is  $10.5 \text{ grams per cm}^3$ .

Work out the mass of the silver chain.

$\dots\dots\dots$  grams

(Total 2 marks)

Q14



15. Fred did a survey of the time, in seconds, people spent in a queue at a supermarket. Information about the times is shown in the table.

Time ( $t$ seconds)	Frequency
$0 < t \leq 40$	8
$40 < t \leq 80$	12
$80 < t \leq 120$	14
$120 < t \leq 160$	16
$160 < t \leq 200$	10

(a) Write down the modal class interval.

..... seconds  
(1)

A person is selected at random from the people in Fred's survey.

(b) Work out an estimate for the probability that the person selected spent more than 120 seconds in the queue.

.....  
(2)

(Total 3 marks)

Q15

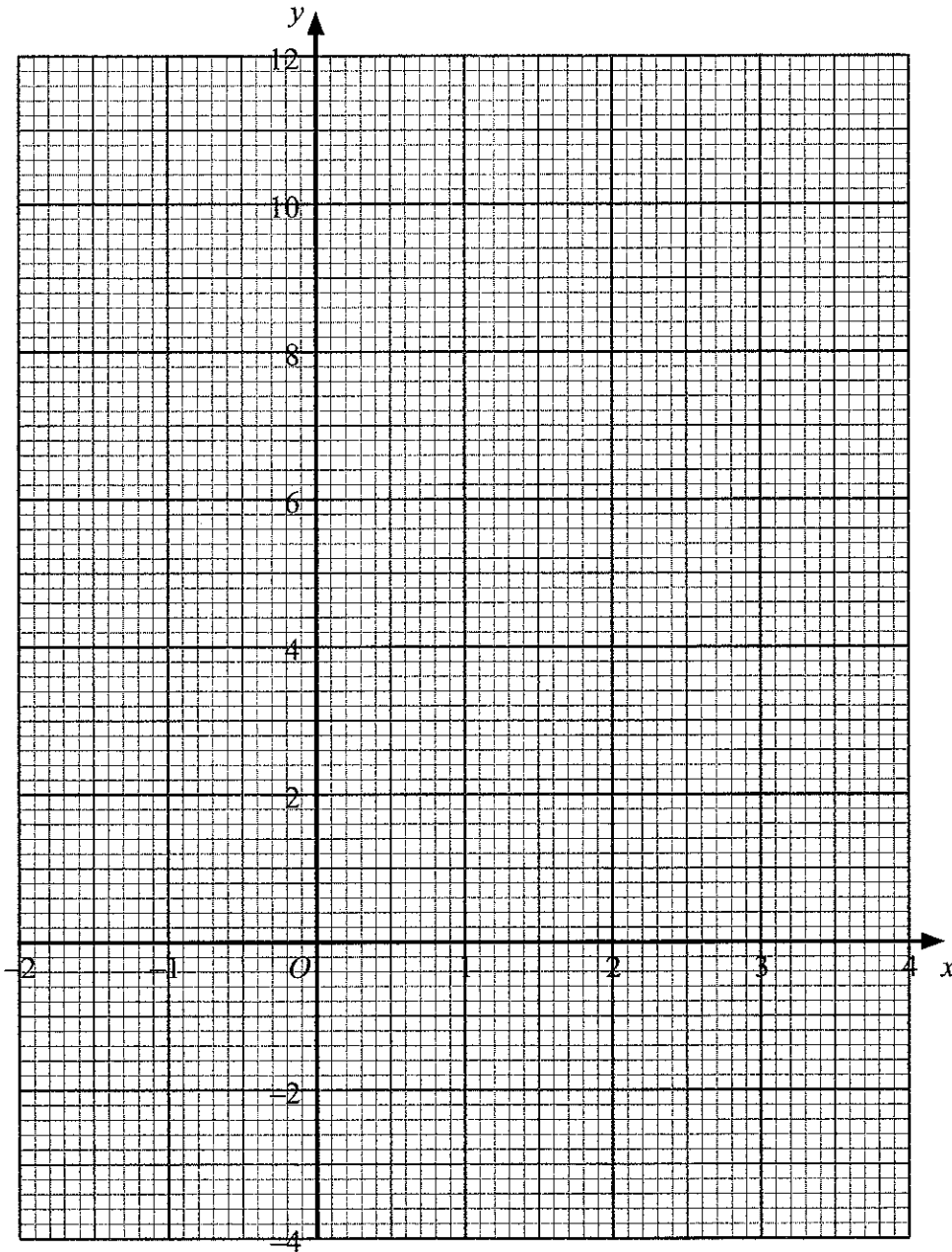


16. (a) Complete the table of values for  $y = x^2 - 3x + 1$

$x$	-2	-1	0	1	2	3	4
$y$	11		1	-1			5

(2)

(b) On the grid, draw the graph of  $y = x^2 - 3x + 1$



(2)

(c) Use your graph to estimate the values of  $x$  for which  $y = 3$

$x = \dots\dots\dots$

$x = \dots\dots\dots$

(2)

Q16

(Total 6 marks)



17. A gold necklace has a mass of 127 grams, correct to the nearest gram.

(a) Write down the **least** possible mass of the necklace.

..... grams  
(1)

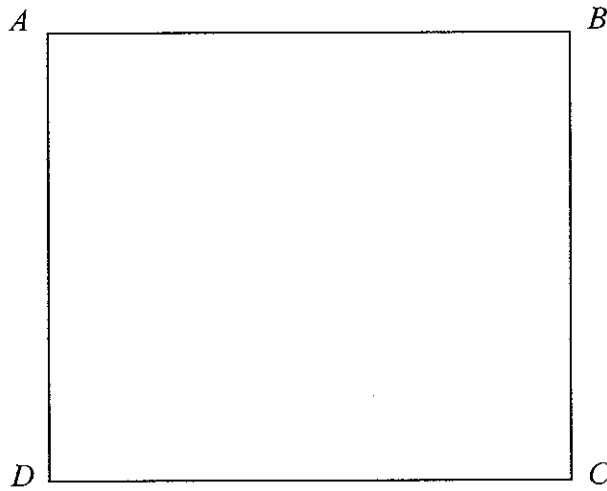
(b) Write down the **greatest** possible mass of the necklace.

..... grams  
(1)

(Total 2 marks)

Q17

18.



*ABCD* is a rectangle.

Shade the set of points inside the rectangle which are **both**

more than 4 centimetres from the point *A*  
**and** more than 1 centimetre from the line *DC*.

Q18

(Total 4 marks)



19. A student wanted to find out how many pizzas adults ate.

He used this question on a questionnaire.

'How many pizzas have you eaten?'

A few

A lot

(a) Write down **two** things that are wrong with this question.

.....

.....

.....

(2)

(b) Design a better question that the student can use to find out how many pizzas adults ate.  
You should include some response boxes.

(2)

Q19

(Total 4 marks)



20. Work out an estimate for  $\frac{412 \times 5.904}{0.195}$

.....

Q20

(Total 3 marks)

21. Write in standard form

(a) 456 000

.....

(1)

(b) 0.00034

.....

(1)

(c)  $16 \times 10^7$

.....

(1)

Q21

(Total 3 marks)



22. (a) Factorise  $x^2 + 6x + 8$

.....  
(2)

(b) Solve  $x^2 + 6x + 8 = 0$

$x =$  .....  
or  $x =$  .....  
(1)

(Total 3 marks)

Q22

23. Hajra's weekly pay this year is £240  
This is 20% more than her weekly pay last year.

Bill says 'This means Hajra's weekly pay last year was £192'.

Bill is wrong.

(a) Explain why.

.....  
.....  
(1)

(b) Work out Hajra's weekly pay last year.

£ .....  
(2)

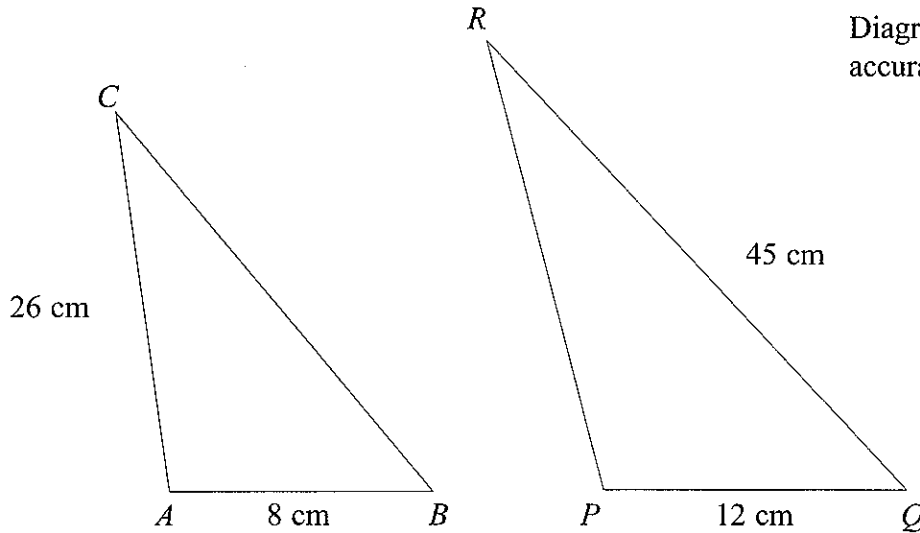
(Total 3 marks)

Q23



24.

Diagrams NOT accurately drawn



The two triangles  $ABC$  and  $PQR$  are mathematically similar.

Angle  $A =$  angle  $P$ .

Angle  $B =$  angle  $Q$ .

$AB = 8$  cm.

$AC = 26$  cm.

$PQ = 12$  cm.

$QR = 45$  cm.

(a) Work out the length of  $PR$ .

..... cm  
(2)

(b) Work out the length of  $BC$ .

..... cm  
(2)

(Total 4 marks)

Q24



25. A company tested 100 batteries.

The table shows information about the time in hours that the batteries lasted.

Time ( $t$ hours)	Frequency
$50 \leq t < 55$	12
$55 \leq t < 60$	21
$60 \leq t < 65$	36
$65 \leq t < 70$	23
$70 \leq t < 75$	8

(a) Complete the cumulative frequency table.

(1)

Time ( $t$ hours)	Cumulative frequency
$50 \leq t < 55$	12
$50 \leq t < 60$	
$50 \leq t < 65$	
$50 \leq t < 70$	
$50 \leq t < 75$	

(b) On the grid, draw a cumulative frequency graph for your completed table.

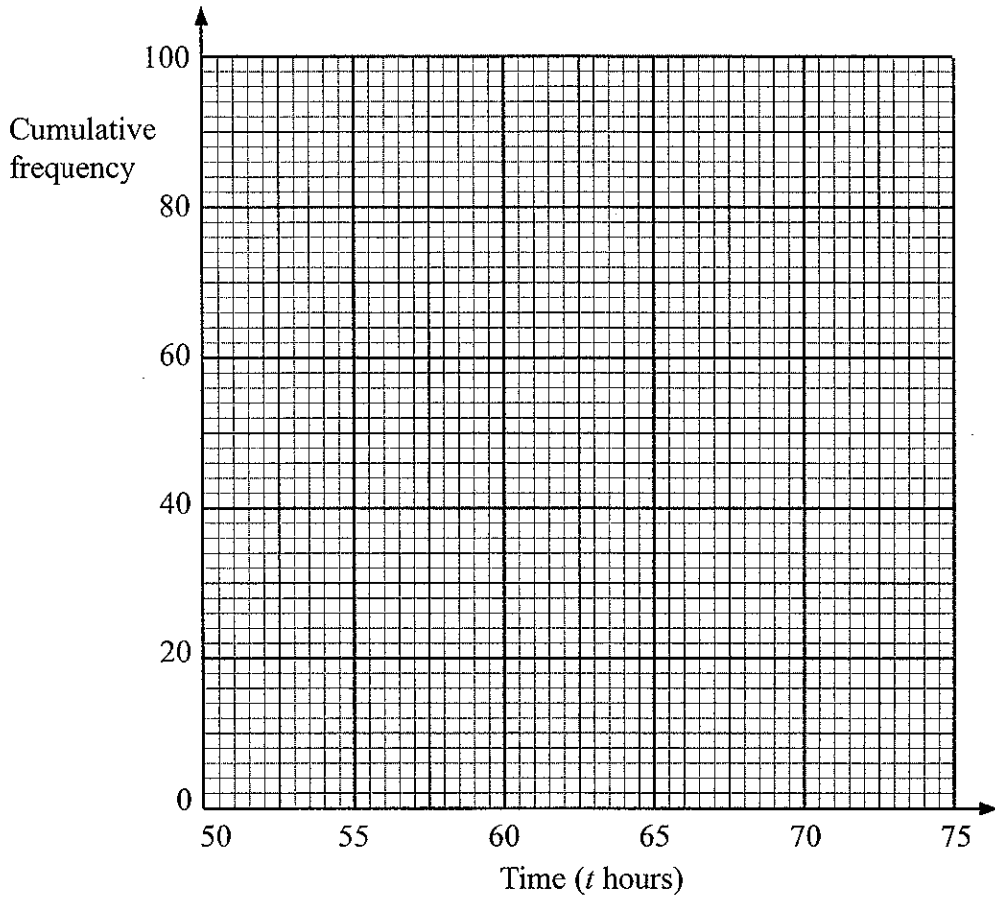
(2)

(c) Use your completed graph to find an estimate for the median time.

..... hours  
(1)



Leave blank

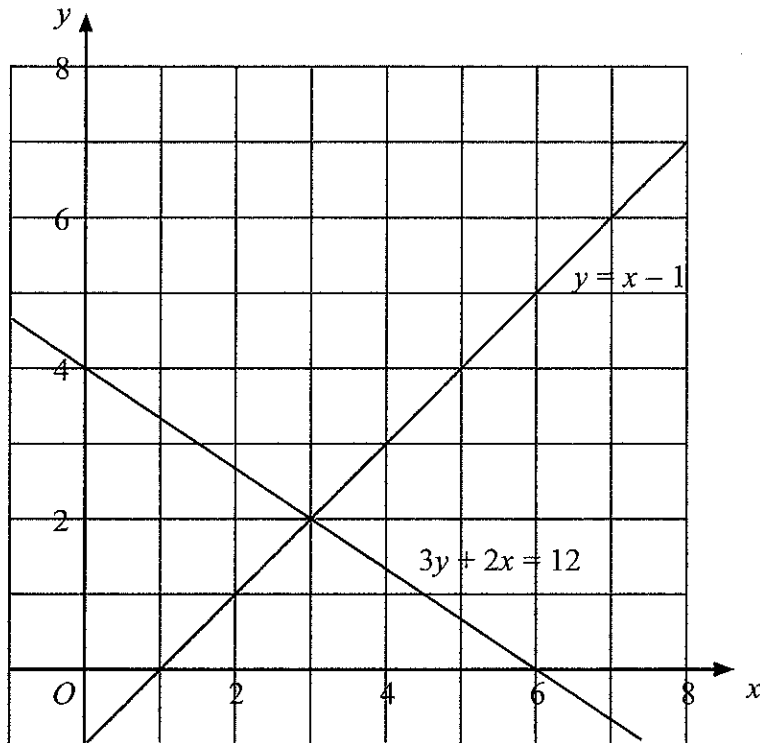


Q25

(Total 4 marks)



26. The graphs of the straight lines with equations  $3y + 2x = 12$  and  $y = x - 1$  have been drawn on the grid.



(a) Use the graphs to solve the simultaneous equations

$$\begin{aligned} 3y + 2x &= 12 \\ y &= x - 1 \end{aligned}$$

$x = \dots\dots\dots$

$y = \dots\dots\dots$

(1)

(b)  $3y + 2x > 12$        $y < x - 1$        $x < 6$

$x$  and  $y$  are integers.

On the grid, mark with a cross (×) each of the **four** points which satisfies **all** these 3 inequalities.

(3)

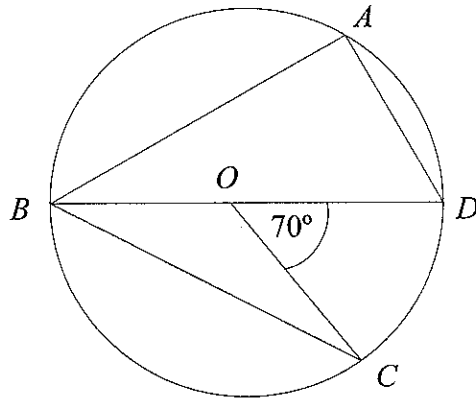
(Total 4 marks)

Q26



27.

Diagram NOT accurately drawn



$A, B, C$  and  $D$  are points on the circumference of a circle, centre  $O$ .  
 $BOD$  is a straight line.  
 Angle  $COD = 70^\circ$

- (a) Find the size of angle  $BAD$ .  
 Give a reason for your answer.

.....<sup>o</sup>  
 (2)

- (b) Find the size of angle  $CBD$ .  
 Give a reason for your answer.

.....<sup>o</sup>  
 (2)

(Total 4 marks)

Q27

TOTAL FOR PAPER: 100 MARKS

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