Rewarding Learning

Centre Number	
71	

Candidate Number

General Certificate of Secondary Education
2010

Mathematics

Module N3 Paper 2
(With calculator)
Higher Tier

[GMN32]

GMN32

TUESDAY 1 JUNE

10.30 am – 11.30 am

TIME

1 hour.

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.
Write your answers in the spaces provided in this question paper.
Answer **all thirteen** questions.
Any working should be clearly shown in the spaces provided since marks may be awarded for partially correct solutions.

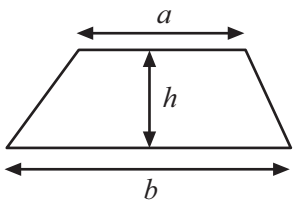
INFORMATION FOR CANDIDATES

The total mark for this paper is 44.
Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.
You should have a calculator, ruler, compasses, set-square and protractor.
The Formula Sheet is on page 2.

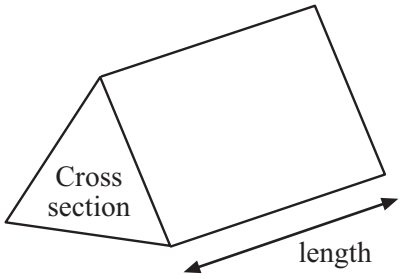
For Examiner's use only	
Question Number	**Marks**
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
Total Marks	

Formula Sheet

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



Volume of prism = area of cross section × length

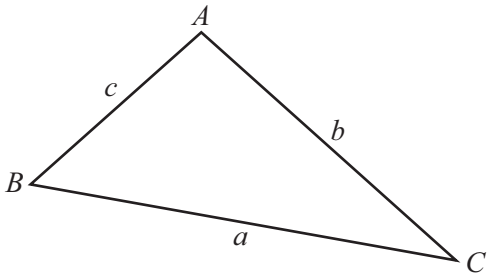


In any triangle ABC

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

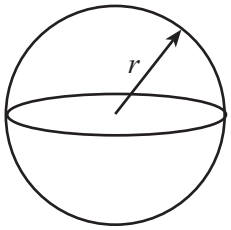
Sine rule : $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

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



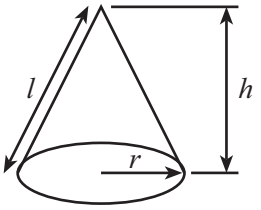
Volume of sphere = $\frac{4}{3}\pi r^3$

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



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

Curved surface area of cone = $\pi r l$

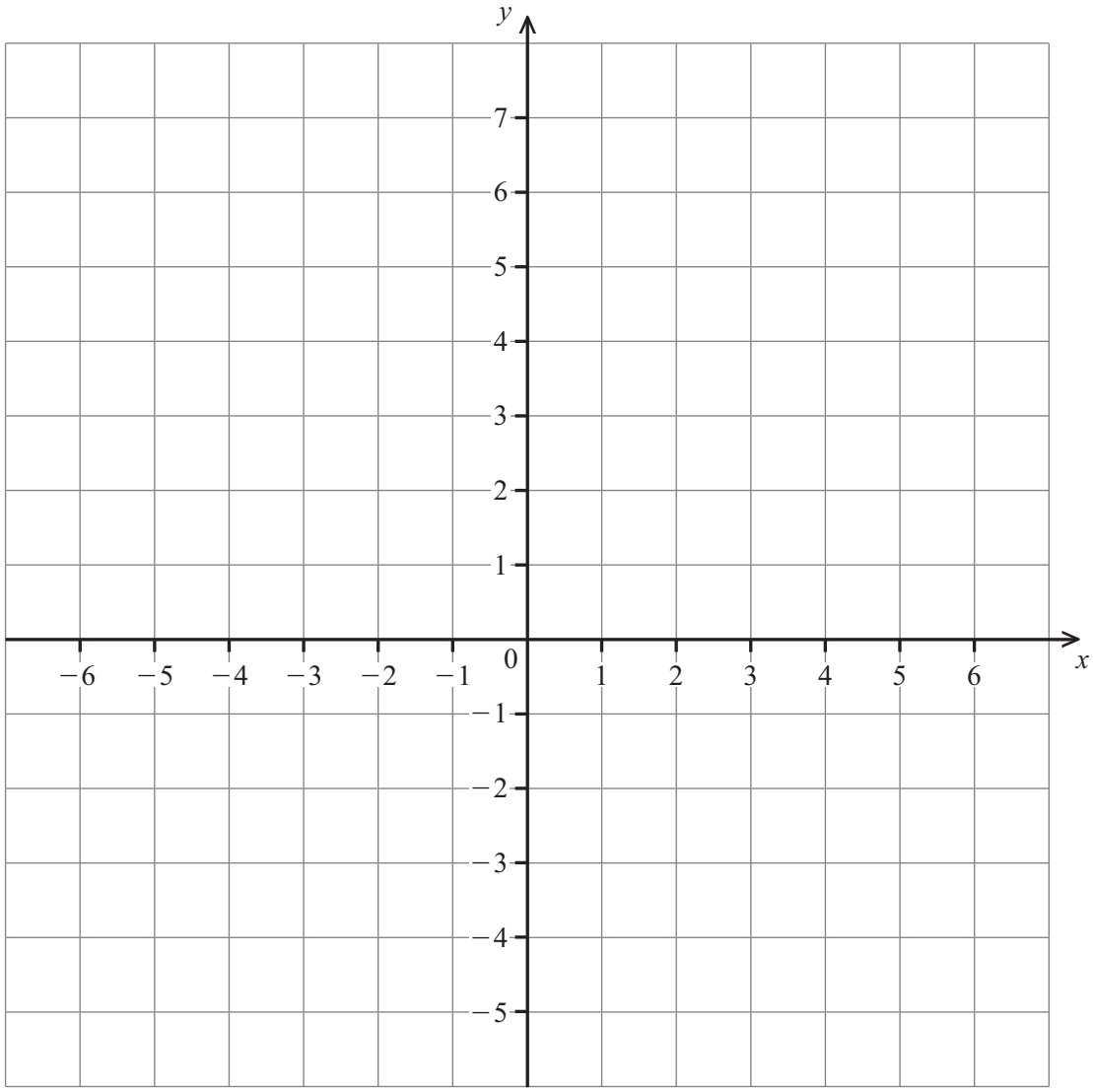


Quadratic equation:

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



Draw the line $y = 2x - 1$ on the grid. [3]

Examiner Only	
Marks	Remark

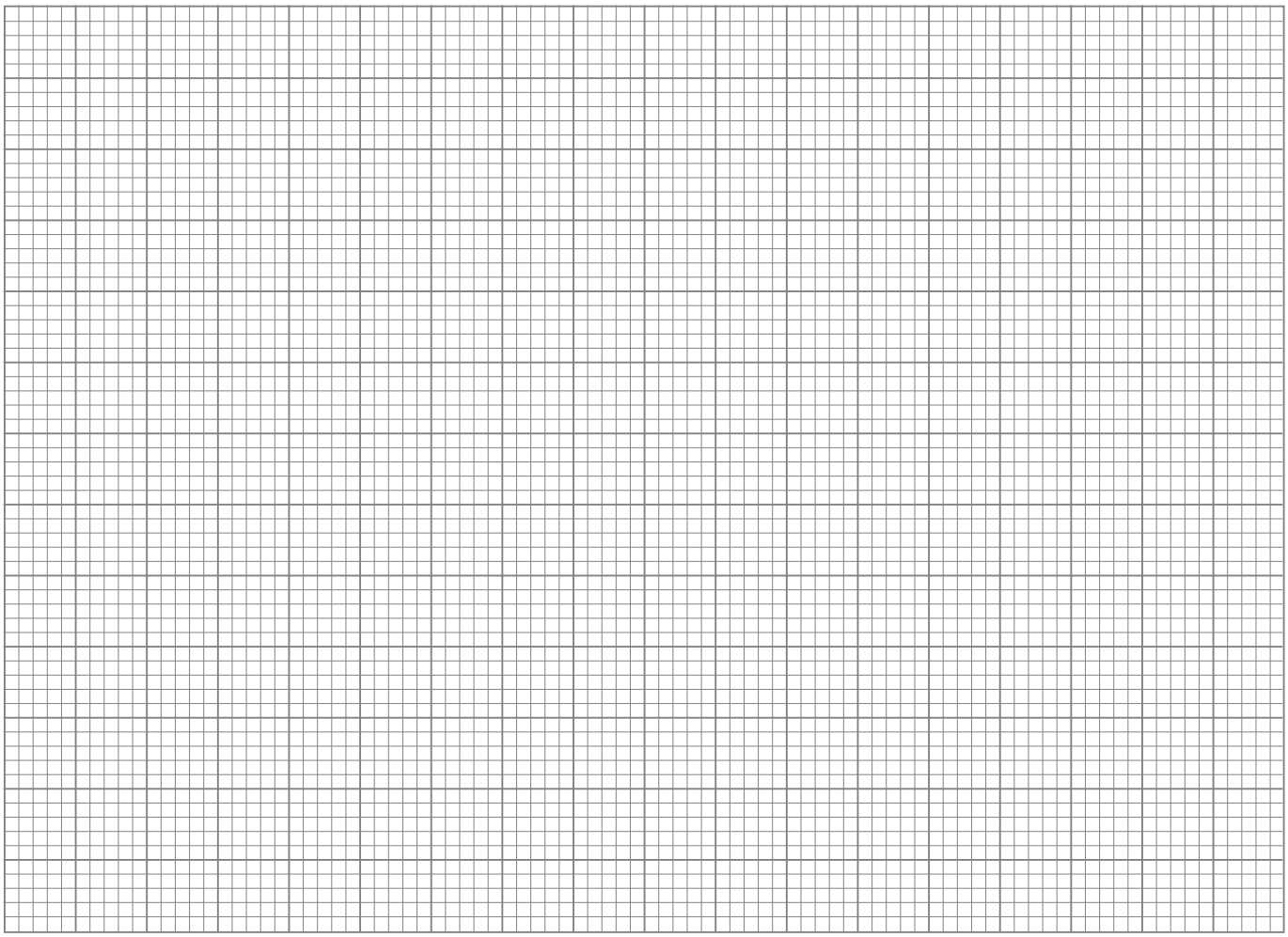
[Turn over

2 The ages of members of a health club were recorded.

Examiner Only	
Marks	Remark

Age (years)	0–9	10–19	20–29	30–39	40–49	50–59
Frequency	5	28	36	25	14	10

Draw a grouped frequency diagram for this data. [3]



Examiner Only	
Marks	Remark

3 Jane is having a party. She needs twelve cans of cola.
A single can of cola costs 40p in each of two local shops.
Each shop has a particular offer on cans of cola.

* Ventra *	* Viva *
20% off every twelve cans	buy 3 for the price of 2

Which is better value?
Show your working clearly.

Answer _____ [4]

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4 Give the names of two different shapes which both have equal sides of length x and both have perimeters of length $4x$.

Answer _____ and _____ [3]

[Turn over

Examiner Only	
Marks	Remark

5 PQRS is a square.
PQ has length $(5x - 14)$ cm.
PS has length $(3x + 38)$ cm.

(a) Write down an equation in terms of x.

Answer _____ [1]

(b) Solve your equation to find the value of x.

Answer x = _____ [3]

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6 A = (4, –5), B = (–2, 9)
Find the co-ordinates of the midpoint of the line AB.

Answer (_____, _____) [2]

7 The time taken by ladies to complete the Belfast "Runher" Fun Run were recorded to the nearest minute.

Time (min)	Number of ladies	Mid value	
25–34	13	29.5	
35–44	107		
45–54	234		
55–64	71		
65–74	22		
75–84	1		

(a) Which class interval contains the median time?

Answer _____ [1]

(b) Calculate an estimate for the mean time to complete the Fun Run.

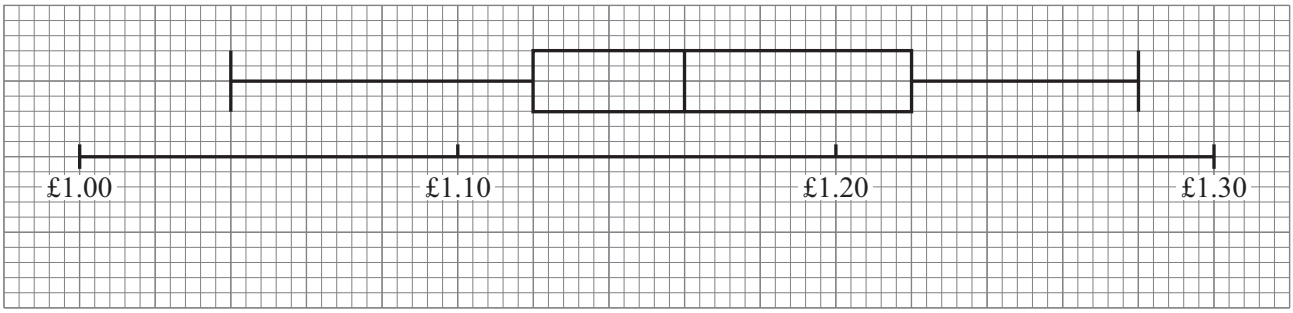
Answer _____ minutes [3]

Examiner Only

Marks	Remark

[Turn over

8 The boxplot shows information about the price of a litre of diesel in a number of garages in England.



(a) What is the range of these prices?

Answer _____p [1]

(b) In the same number of garages in Northern Ireland the interquartile range was 8 pence.
How does this value compare with the interquartile range in the boxplot shown?

_____

_____ [1]

Examiner Only	
Marks	Remark

Examiner Only	
Marks	Remark

9 The mass of bacteria in a mixture increases by 5% every hour.
At 9.00 am there is 120 mg of bacteria.
What will the mass of bacteria be at midday?

Answer _____ mg [3]

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10 Find the perimeter of a semi-circle with diameter 15 cm.

Answer _____ [4]

11 One hundred and twenty men in a city company have their blood pressure taken. The results are shown in the frequency table.

Examiner Only	
Marks	Remark

Frequency table

Blood pressure (P)	Number of men
$P < 100$	4
$100 \leqslant P < 120$	28
$120 \leqslant P < 140$	49
$140 \leqslant P < 160$	28
$160 \leqslant P < 170$	8
$170 \leqslant P < 180$	3

Cumulative frequency table

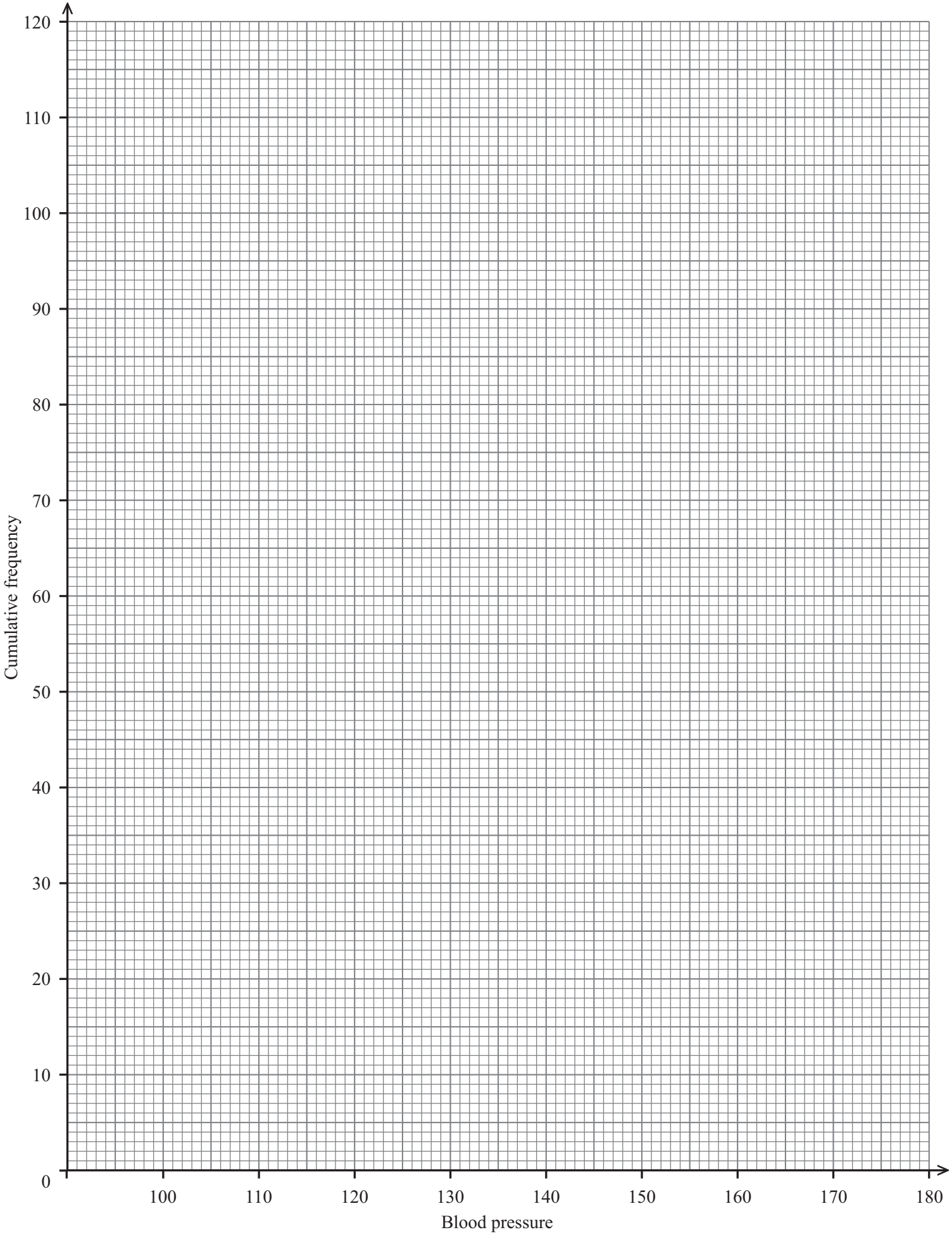
Blood pressure (P) (less than)	Number of men
100	4
120	
140	
160	
170	
180	

(a) Complete the cumulative frequency table. [1]

(b) Draw a cumulative frequency graph to illustrate this information. [3]

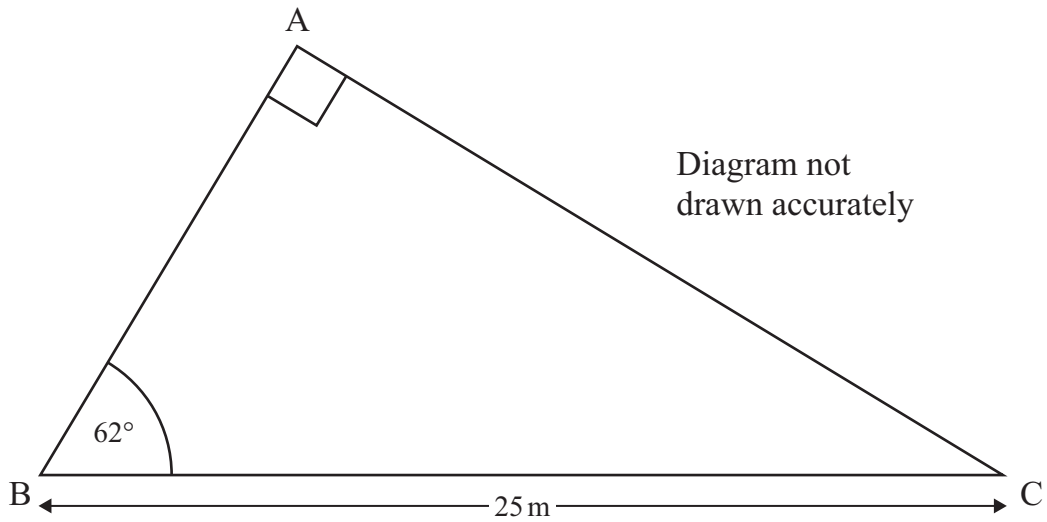
(c) All those men with readings less than 100 or more than 150 must have a retest the following week. How many men must have a retest?

Answer _____ [2]



[Turn over

12



Calculate the length of the side AC.

Answer _____ m [3]

Examiner Only	
Marks	Remark

13 The total bill in a restaurant is £49.22, including a service charge of 15%.
Calculate the bill before the service charge.

Answer £ _____ [3]

THIS IS THE END OF THE QUESTION PAPER