



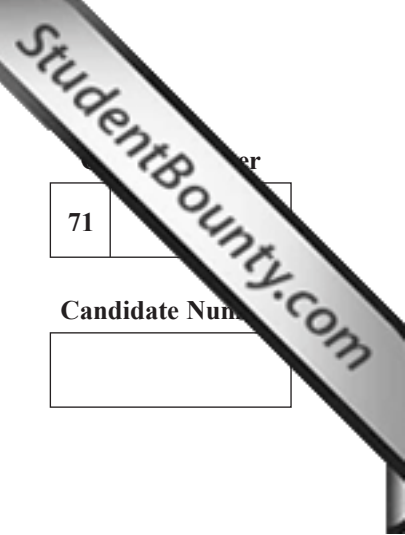
General Certificate of Secondary Education
2010

Mathematics



Module N4 Paper 2
(With calculator)
Higher Tier
[GMN42]

TUESDAY 1 JUNE
10.30 a.m. – 11.30 a.m.



71	er
Candidate Number	
<input type="text"/>	

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 ten** questions.
 Any working should be clearly shown in the spaces provided since marks may be awarded for partially correct solutions.

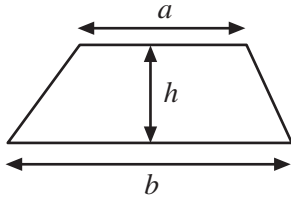
INFORMATION FOR CANDIDATES

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.

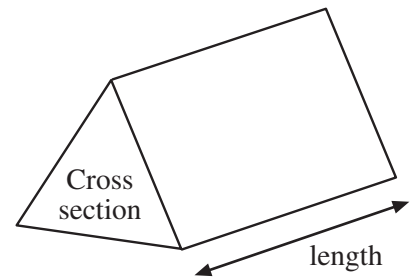
For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
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10	
Total Marks	

Formula Sheet

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



Volume of prism = area of cross section \times length

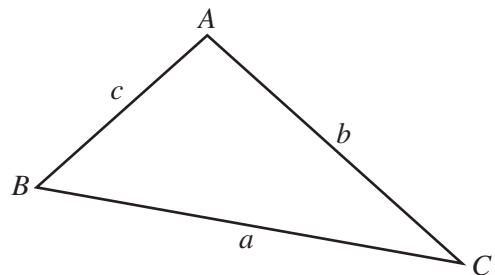


In any triangle ABC

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

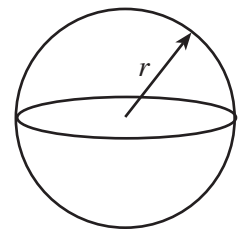
Sine rule: $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

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



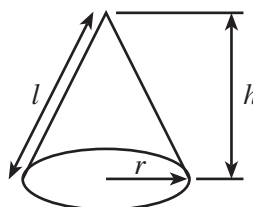
Volume of sphere = $\frac{4}{3}\pi r^3$

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

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

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

Frequency table

Blood pressure (P)	Number of men
$P < 100$	4
$100 \leq P < 120$	28
$120 \leq P < 140$	49
$140 \leq P < 160$	28
$160 \leq P < 170$	8
$170 \leq P < 180$	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) Use your graph to estimate the interquartile range.

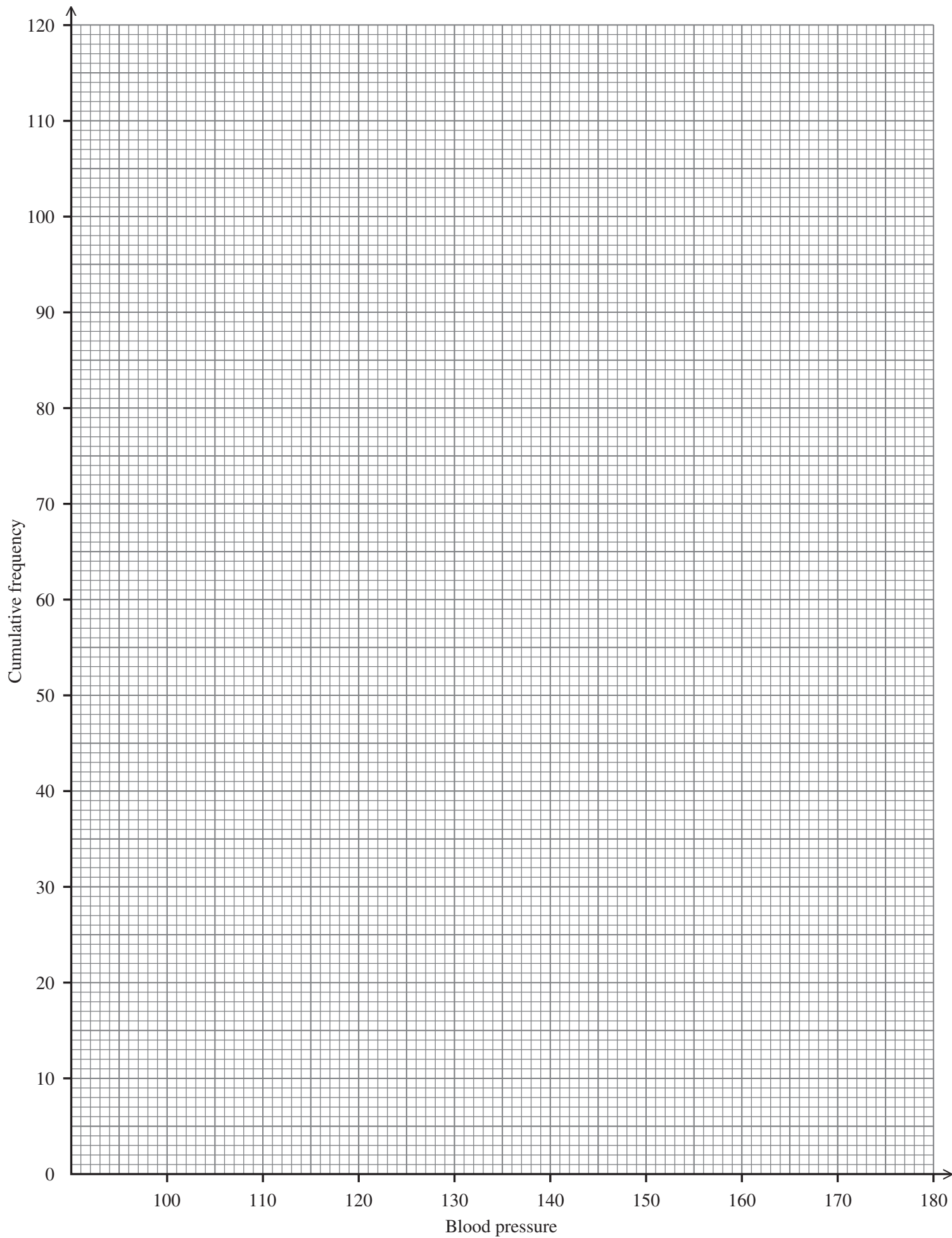
Answer _____ [2]

- (d) All those men with readings less than 100 or more than 150 must have a retest the following week.

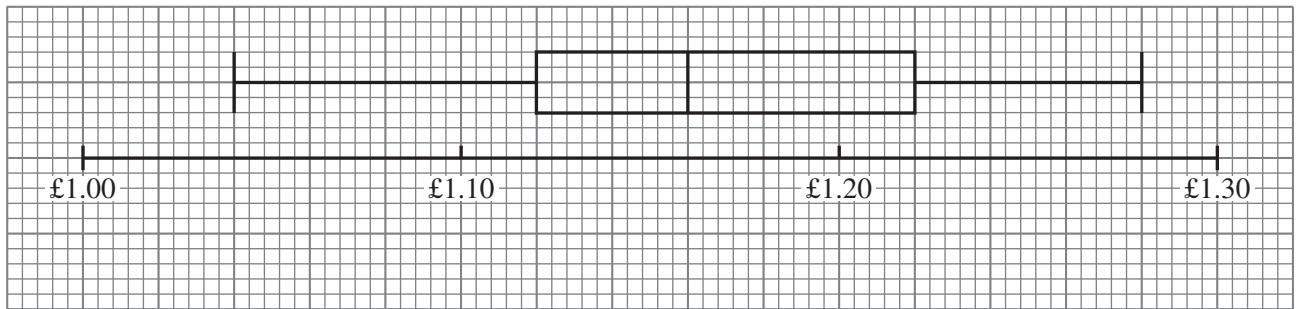
How many men must have a retest?

Answer _____ [2]

Examiner Only	
Marks	Remark



- 2 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]

- 3 A headmaster is concerned about the speed of vehicles passing his school. He sends a questionnaire to the parents of the children at the school. It includes this question.
 “Don’t you agree that vehicles drive far too fast past our school?”
 Explain why this question is unsuitable.

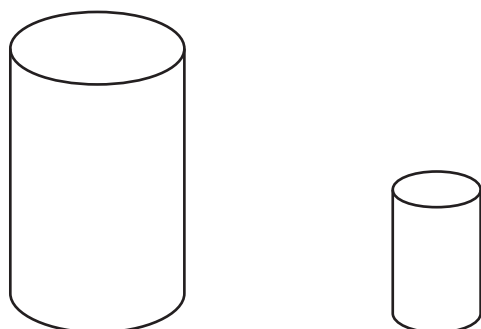
 _____ [1]

Examiner Only	
Marks	Remark

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

Answer £ _____ [3]

5

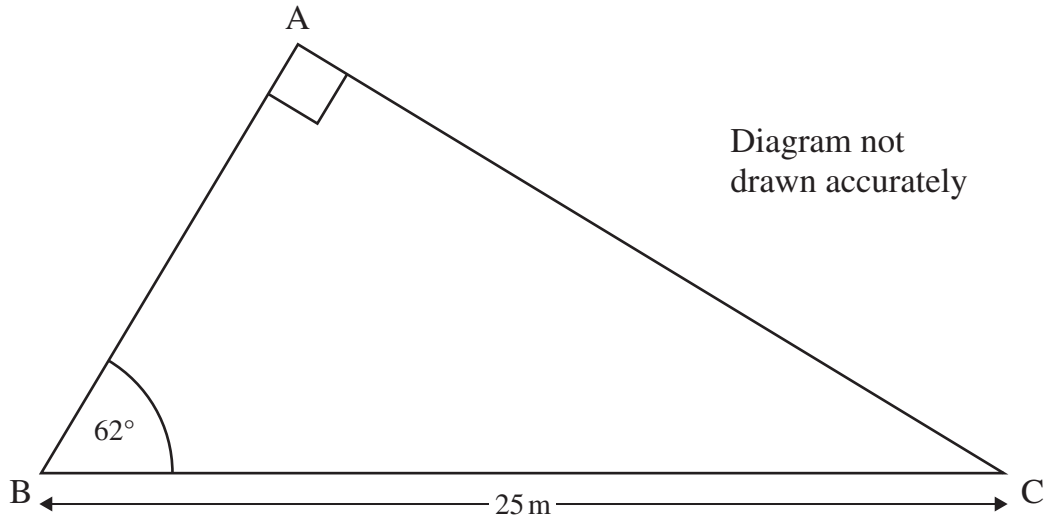


The two cylinders shown above are similar.
The dimensions of the smaller cylinder are half those of the larger cylinder.
The volume of the smaller cylinder is 30 cm^3 .
Find the volume of the larger cylinder.

Answer _____ [3]

Examiner Only	
Marks	Remark

6 (a)

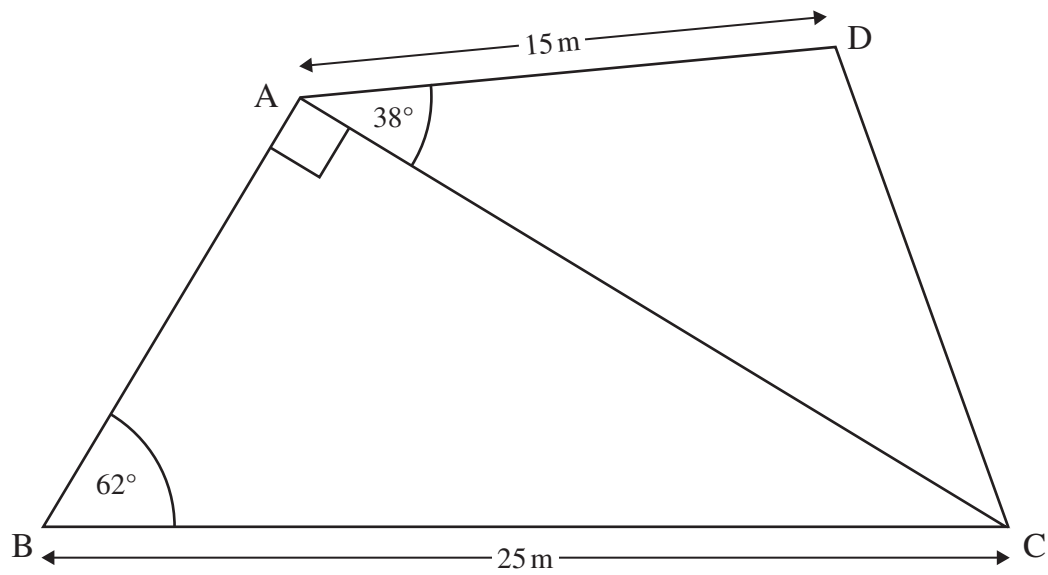


Calculate the length of the side AC.

Answer _____ m [3]

Examiner Only	
Marks	Remark

(b)



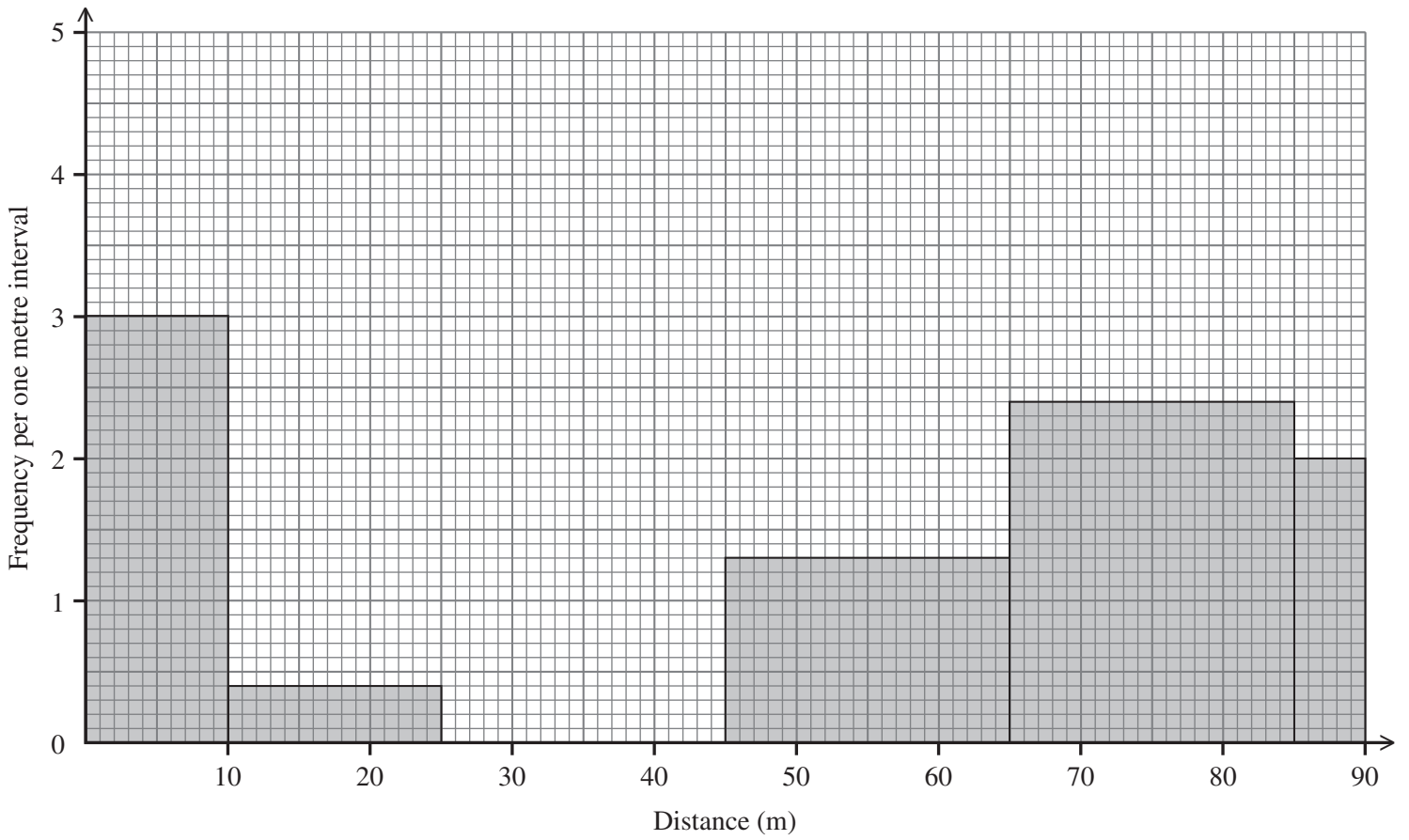
A new triangle ADC is now joined to the triangle ABC with $AD = 15$ m and the angle $DAC = 38^\circ$. Calculate the length of the side DC. **All working must be shown.**

Answer _____ m [3]

Examiner Only

Marks	Remark

7 The histogram shows the distribution of distances thrown in three Olympic qualifying events: Shot, Discus and Javelin.



(a) No competitor in the Shot threw further than 25 metres.
 No competitor in the other events threw less than 45 metres.
 How many competitors took part in the Shot event?

Answer _____ [2]

Examiner Only	
Marks	Remark

8 (a) Expand and simplify $(3x + 4y)(2x - 5y)$

Answer _____ [3]

(b) Simplify $\frac{x^2 + 3x}{2x^2 - 18}$

Answer _____ [3]

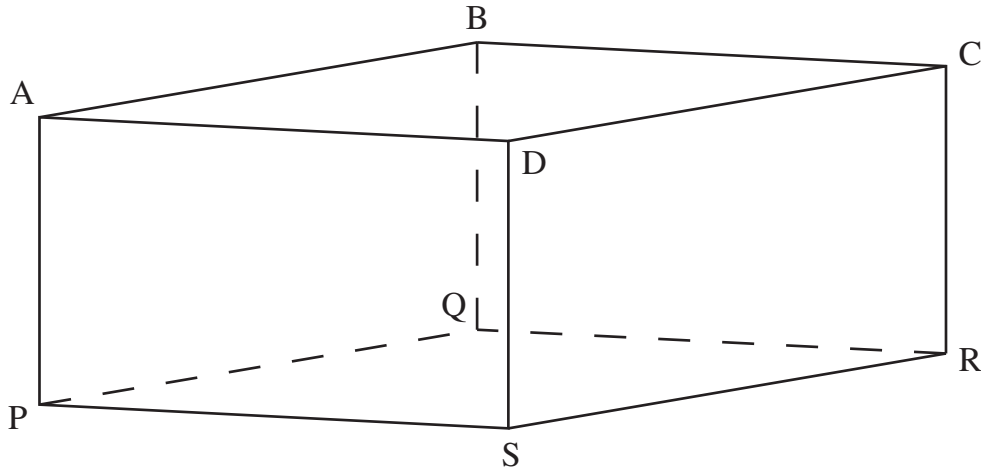
(c) Factorise $8x^2 - 10xy + 3y^2$

Answer _____ [2]

Examiner Only

Marks Remark

9



ABCDPQRS is a cuboid with $PQ = 9$ cm, $QR = 7$ cm and $RC = 4$ cm.
Calculate the angle between the line PC and the base PQRS.

Answer _____° [3]

- 10 Rubin claims that if the length and breadth of a rectangle are both irrational, then it is possible for the perimeter to be **either** rational **or** irrational.
Give examples to justify his claim.

[3]

Examiner Only	
Marks	Remark

THIS IS THE END OF THE QUESTION PAPER

