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Rewarding Learning

Centre Number	
71	

Candidate Number

General Certificate of Secondary Education
January 2010

Mathematics

Module N4 Paper 2
(With calculator)
Higher Tier

[GMN42]

GMN42

TUESDAY 12 JANUARY

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 eleven** 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	
Total Marks	

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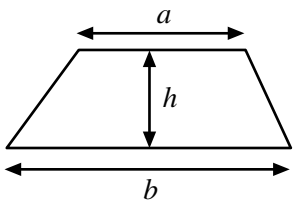
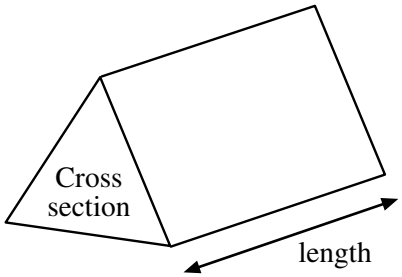
Formula Sheet

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



Volume of prism = area of cross section × length

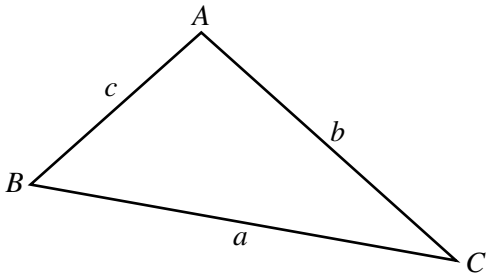


In any triangle ABC

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

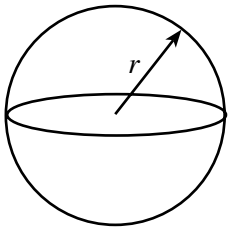
Sine rule : $\dfrac{a}{\sin A} = \dfrac{b}{\sin B} = \dfrac{c}{\sin C}$

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



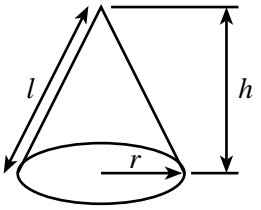
Volume of sphere = $\frac{4}{3}\pi r^3$

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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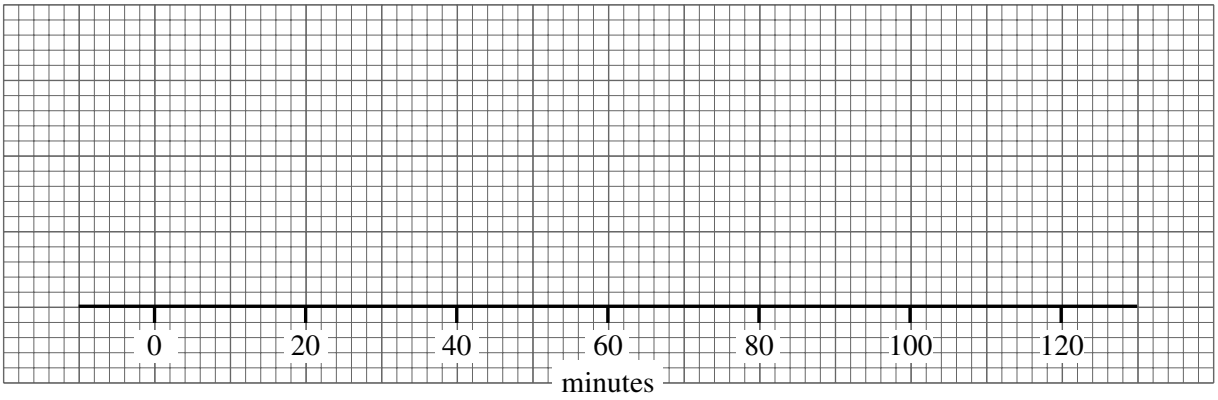
Examiner Only	
Marks	Remark

1 A tennis club holds a Junior Tournament.
The time taken to complete each match is recorded.

(a) The statistical data for the girls' matches is:

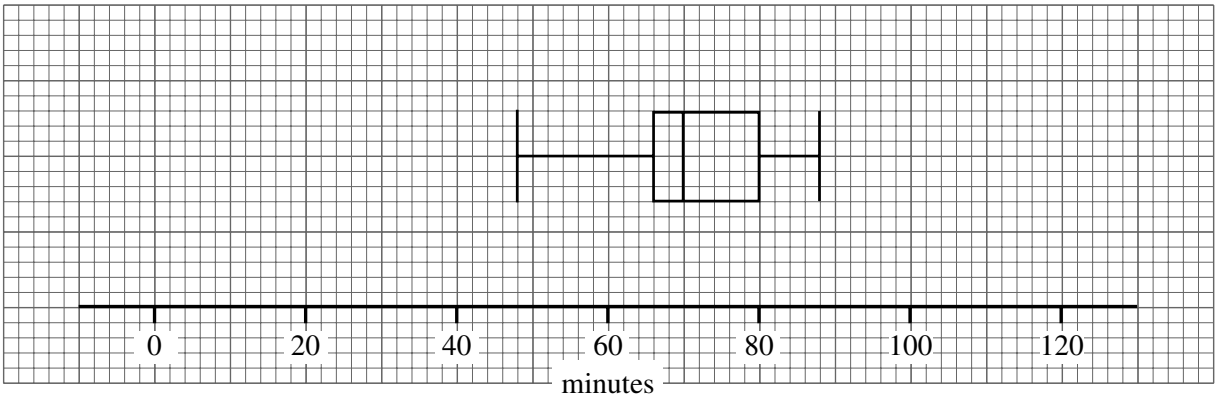
Minimum time	42 minutes
Maximum time	104 minutes
Lower quartile	68 minutes
Upper quartile	90 minutes
Median time	84 minutes

Draw a box plot to illustrate this data.



[2]

(b) Similar data is recorded for the boys' matches and a box plot drawn.



Give **two** comments on the times taken to complete the girls' matches compared to the times taken to complete the boys' matches.

_____ [1]

_____ [1]

[Turn over

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Marks	Remark

2 St Elsewhere High School had an 8% absence rate on a particular day.

If there were 989 pupils present, how many pupils were absent?

Answer _____ [3]

3

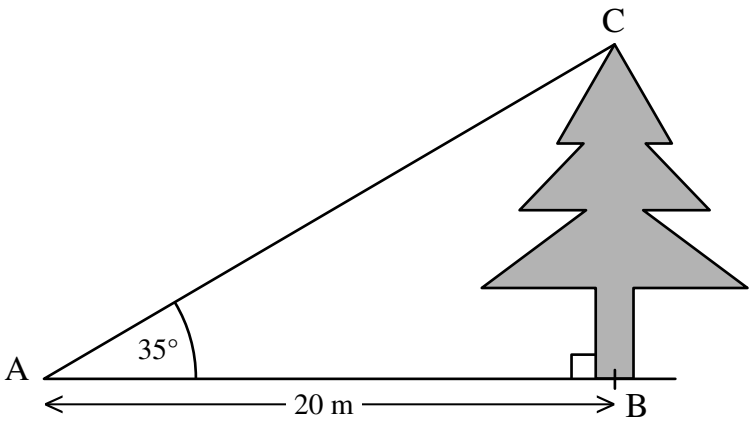

Diagram not drawn accurately

The angle of elevation from A to the top of the tree C is 35°
The distance AB = 20 m.

Calculate the height BC of the tree.

Answer _____ m [3]

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4 Find the volume of a spherical ball of radius 10 cm.

Answer _____ [3]

Examiner Only	
Marks	Remark

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

Answer _____ [2]

(b) Factorise $x^2 - 3x - 40$

Answer _____ [2]

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Examiner Only	
Marks	Remark

6 Write down the equation of the straight line which passes through the point (0, –3) and is perpendicular to the line $y = 4x + 1$

Answer _____ [2]

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7 Calculate the distance between the points with coordinates (3, 1, –4) and (7, 4, 8).

Answer _____ [2]

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8 **(a)** Solve the equation $6m^2 + 7m + 2 = 0$

Answer _____ [3]

(b) Solve the following equation, giving your answers correct to two decimal places.

$$x^2 - 5x - 3 = 0$$

Answer _____ [3]

Examiner Only	
Marks	Remark

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9 The table shows the distribution of the heights of all sixth formers in a school.

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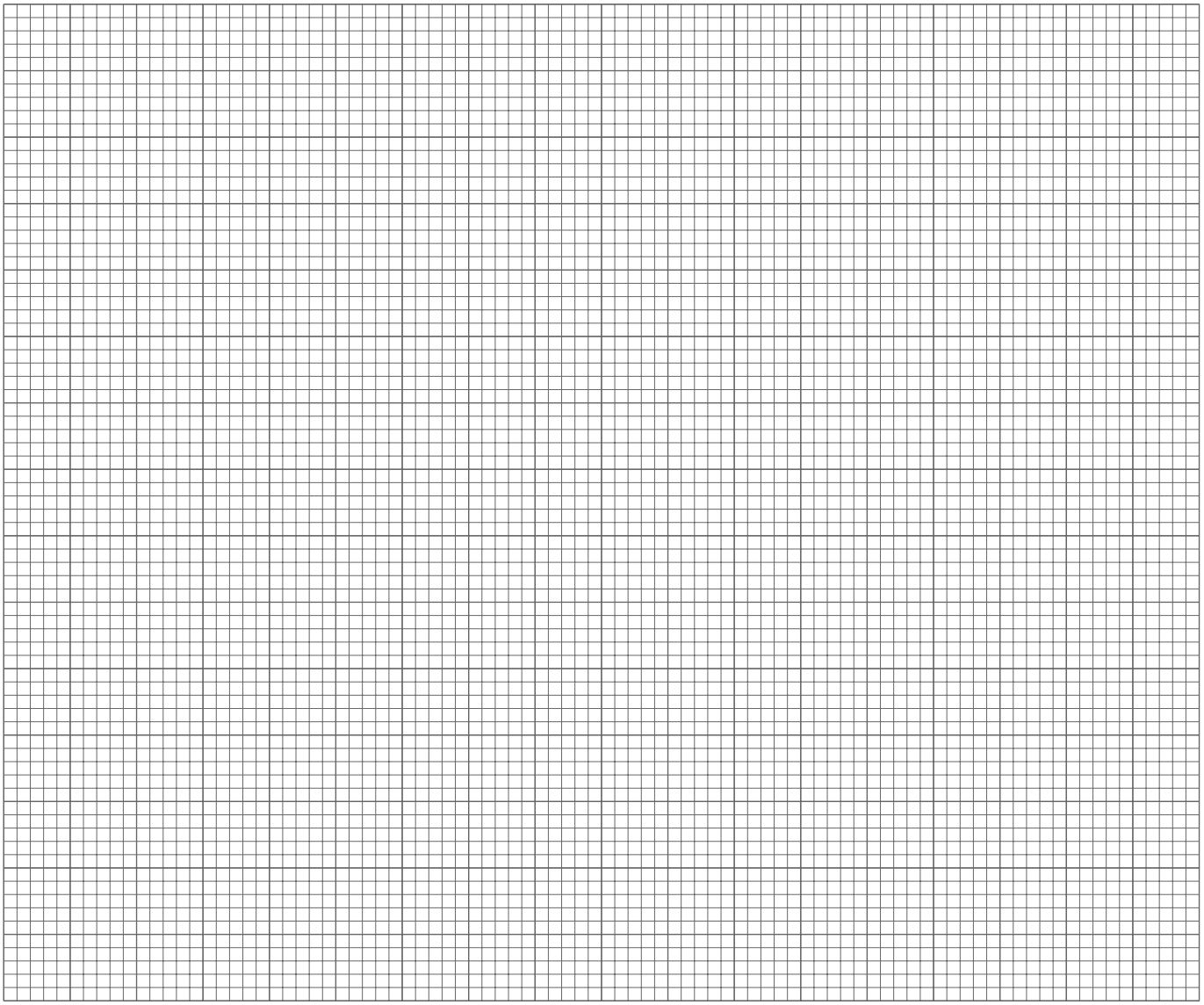
Marks	Remark

Height (h cm)	Number of students
$150 \leqslant h < 165$	45
$165 \leqslant h < 175$	75
$175 \leqslant h < 180$	36
$180 \leqslant h < 185$	66
$185 \leqslant h < 195$	18

(a) Show this information on a histogram on the graph paper below. [3]



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(b) Students at least H cm tall are considered for the basketball team. A stratified sample of 40 students is selected from this group. Six of the stratified sample are at least 185 cm tall.

Calculate the value of H.

Answer H = _____ [3]

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Marks	Remark

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10

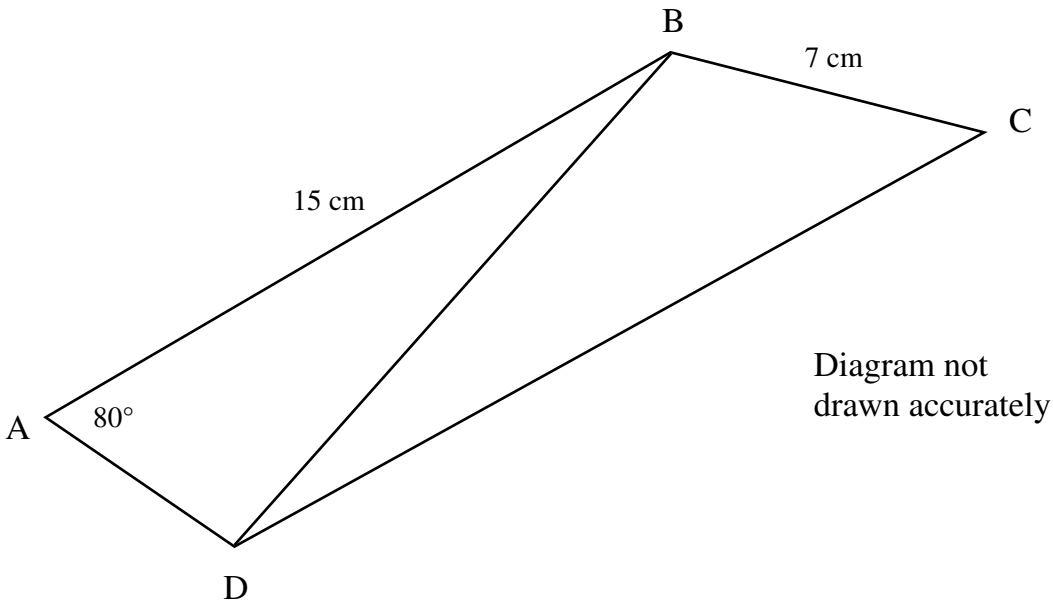

Diagram not drawn accurately

ABD is an isosceles triangle with angle A = 80° and AB = BD.
AB = 15 cm and BC = 7 cm. Angle ABC = 115°
Calculate the length of CD.

Answer _____ cm [4]

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Marks	Remark

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11 Solve $\frac{1}{2x-3}+\frac{4}{x+1}=1$

A solution by trial and improvement will not be accepted.

Answer _____ [7]

Examiner Only	
Marks	Remark

THIS IS THE END OF THE QUESTION PAPER

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