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Rewarding Learning

Centre Number

71	

Candidate Number

General Certificate of Secondary Education
2011

Mathematics

Module N4 Paper 1
(Non-calculator)
Higher Tier

[GMN41]

TUESDAY 31 MAY
9.15 am – 10.15 am

GMN41

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.
You **must not** use a calculator for this paper.

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 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	
Total Marks	

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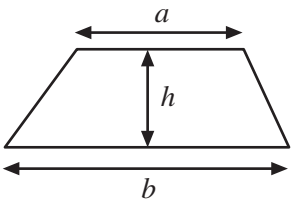
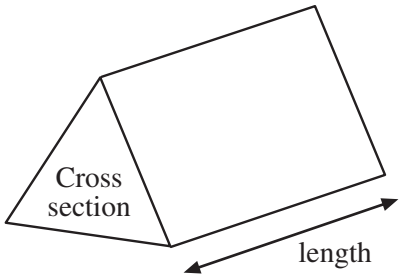
Formula Sheet

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



Volume of prism = area of cross section × length

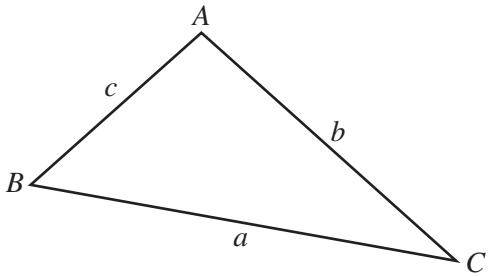


In any triangle ABC

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

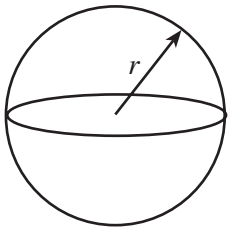
Sine rule : $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

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



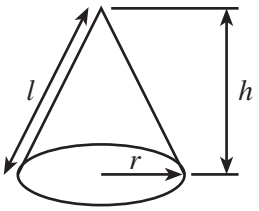
Volume of sphere $= \frac{4}{3}\pi r^3$

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



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

Curved surface area of cone $= \pi rl$



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 Solve the equation $\frac{2x-4}{5}+\frac{x+11}{2}=2$

Show your working.
A solution by trial and improvement will not be accepted.

Answer $x =$ _____ [4]

---

2 Calculate $2\frac{1}{3} \div 1\frac{1}{4}$

Give your answer as a mixed number.

Answer _____ [3]

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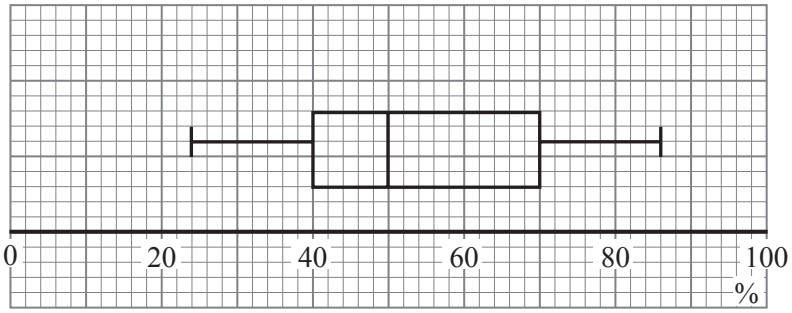
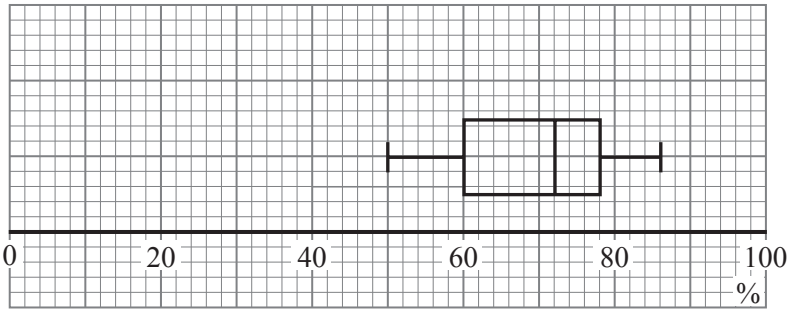
Examiner Only	
Marks	Remark

3 The box plots show the distribution of test results for two different classes.

Class P



Class Q



Comment on **two** differences between the classes.

(i) _____

_____ [1]

(ii) _____

_____ [1]

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Marks	Remark

4 **(a)** In the diagram O is the centre of the circle.
SOQ is a straight line.
Angle ORQ = 41° and angle PQS = 24°

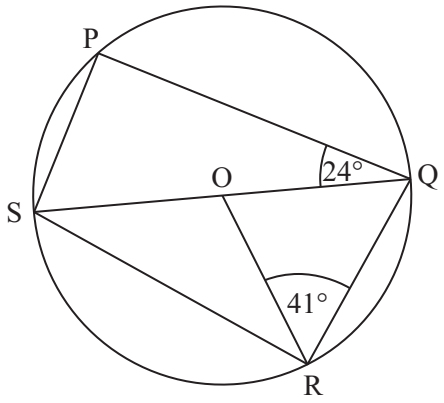


diagram not drawn accurately

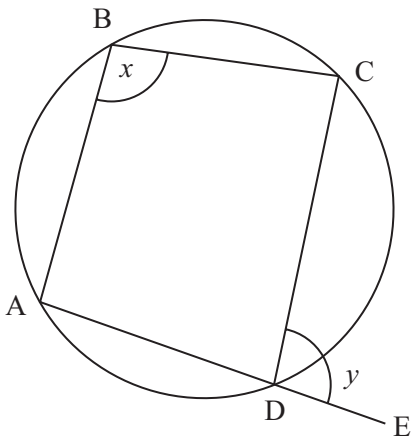
Find the size of the following angles:

(i) OQR = _____ ° [1]

(ii) PSQ = _____ ° [1]

(iii) PSR = _____ ° [1]

(b) Prove that the exterior angle of the cyclic quadrilateral equals the interior opposite angle (i.e. $x = y$)



[3]

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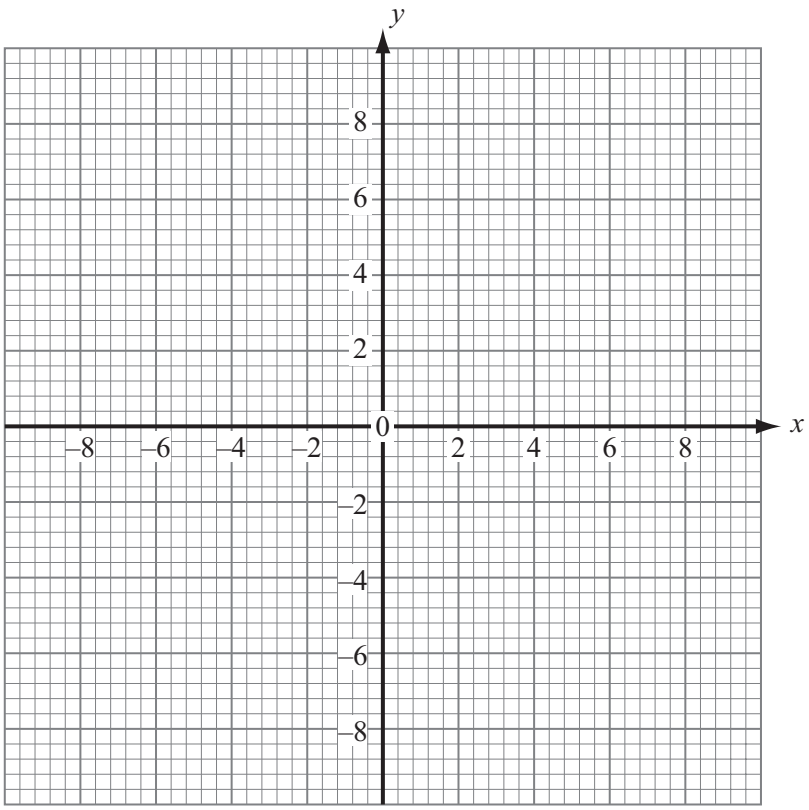
Marks	Remark

5 **(a)** On the grid below show by shading and the letter R, the region represented by the inequalities

$y \leq 3x + 2$
$y \geq -6$
$2x + y \leq 7$



[3]

(b) Find the maximum value of $2x - y$, where x, y are integers, from a point of your solution set.

Answer _____ [2]

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Marks	Remark

6 Triangles ABC and DEC are similar triangles.
Find the length of AD.

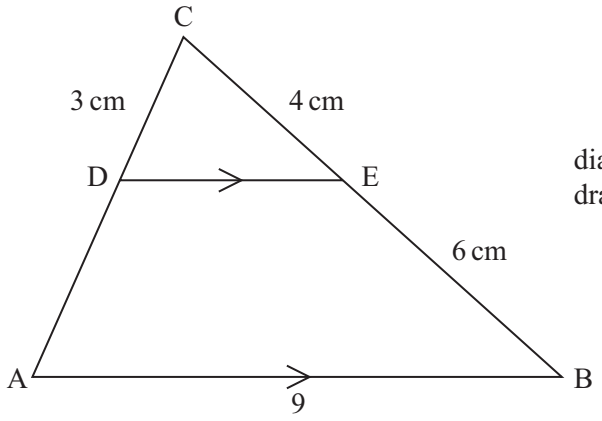

diagram not drawn accurately

Answer: AD = _____ cm [3]

---

7 Evaluate

(a) $81^{0.5}$

Answer _____ [1]

(b) $125^{\frac{2}{3}}$

Answer _____ [2]

(c) $32^{-0.4}$

Answer _____ [2]

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8 The table gives information about the weights of 100 children.

Weight, w kg	Number of children
$20 \leq w < 30$	16
$30 \leq w < 35$	28
$35 \leq w < 40$	36
$40 \leq w < 60$	18
$60 \leq w < 65$	2

(a) Illustrate the data by drawing a histogram (A) on the graph paper opposite. [3]

(b) A stratified sample of 20 children was taken from those whose weight was less than 40 kg.

How many of the sample were taken from the interval $35 \leq w < 40$?

Answer _____ [2]

(c) The histogram (B) already drawn illustrates the weights of a different group of 100 children. Compare this histogram with the one you have drawn. Give two comparisons.

Comparison 1: _____

_____ [1]

Comparison 2: _____

_____ [1]

(d) Suggest a reason for the difference in the two histograms.

Answer _____

_____ [1]

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Marks	Remark

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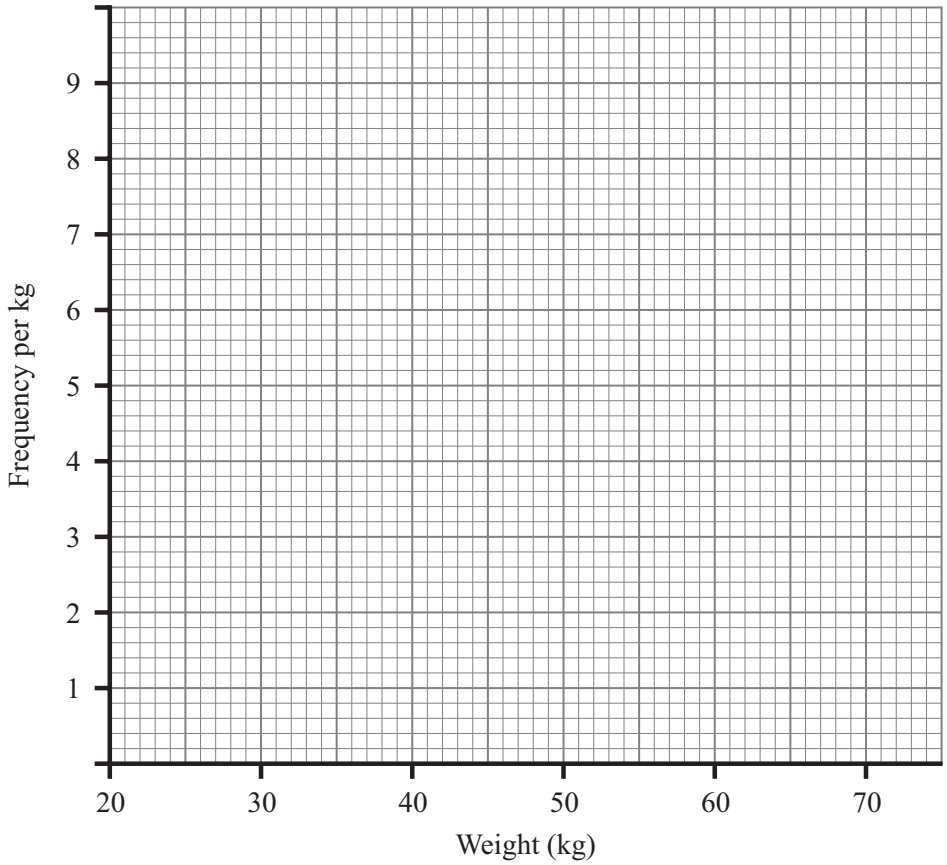
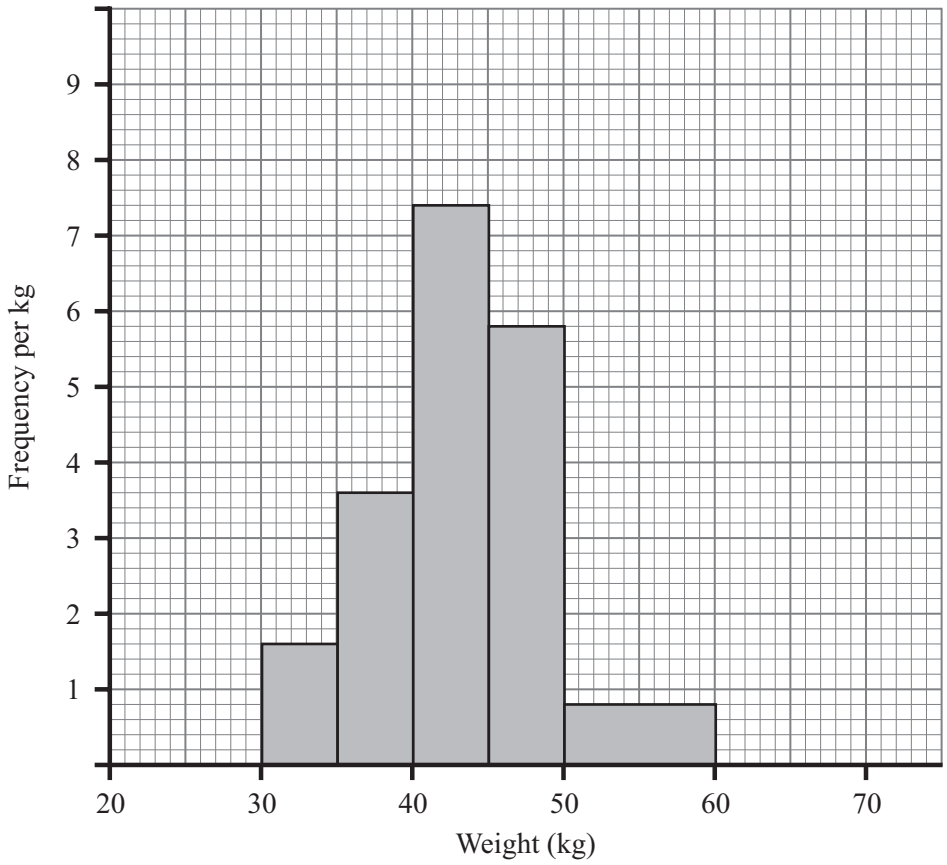
A



B



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Marks	Remark

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Marks	Remark

9 The following equation has solutions which are rational.

$$\frac{8x^2}{3} = 6$$

Write down a **similar** equation with solutions which are **irrational**.

Explain your answer.

Answer _____ because _____

_____ [2]

---

10 Solve $\frac{10}{2x-5} + \frac{7}{x+2} = 3$

A solution by trial and improvement will not be accepted.

Answer _____ [6]

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THIS IS THE END OF THE QUESTION PAPER

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