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General Certificate of Secondary Education  
2011

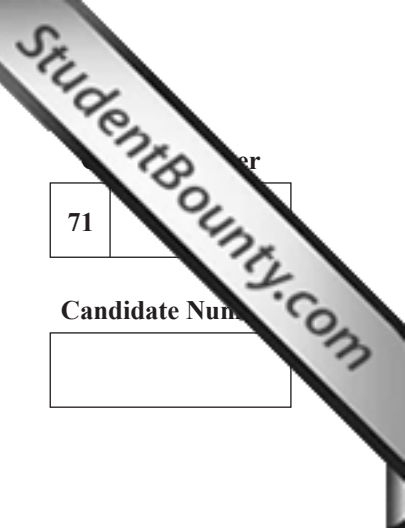
### Mathematics

Module N4 Paper 2  
(With calculator)  
Higher Tier

[GMN42]

TUESDAY 31 MAY

10.30 am – 11.30 am



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71	
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.

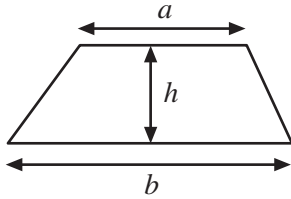
The Formula Sheet is on page 2.

For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
<b>Total Marks</b>	

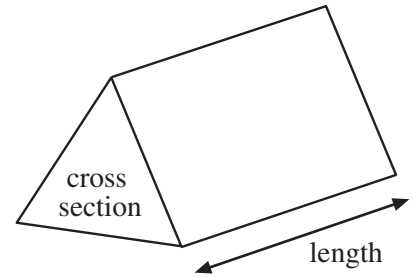


# Formula Sheet

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



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

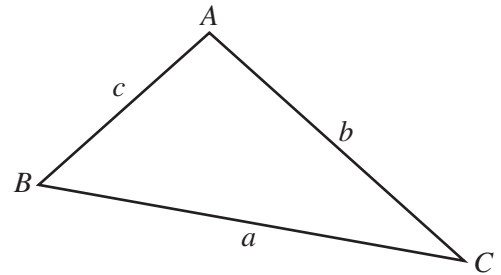


**In any triangle ABC**

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

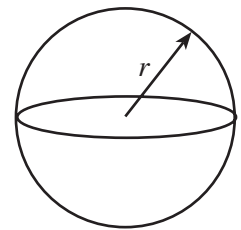
**Sine rule:**  $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

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



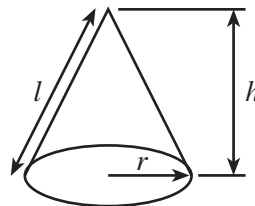
**Volume of sphere** =  $\frac{4}{3}\pi r^3$

**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

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



3 The graph opposite shows the cumulative frequency of scores obtained in a darts tournament.

(a) Use the graph to estimate

(i) the median,

Answer \_\_\_\_\_ [1]

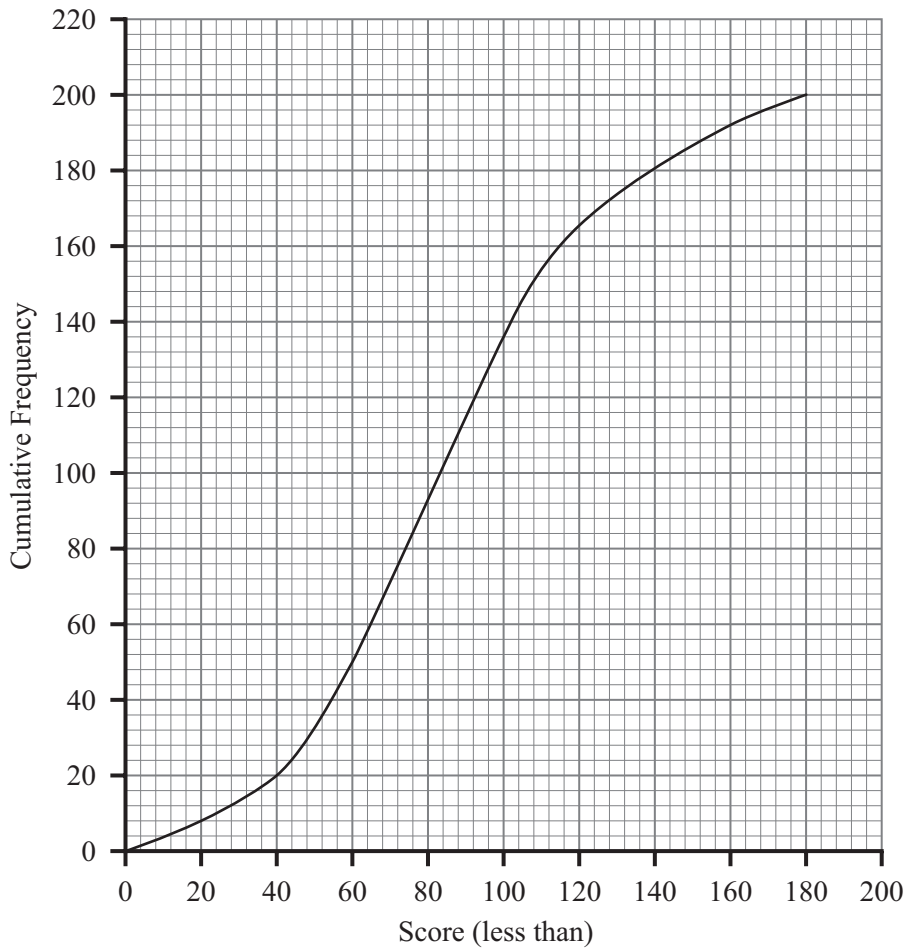
(ii) the inter-quartile range,

Answer \_\_\_\_\_ [2]

(iii) how many scores were more than 150

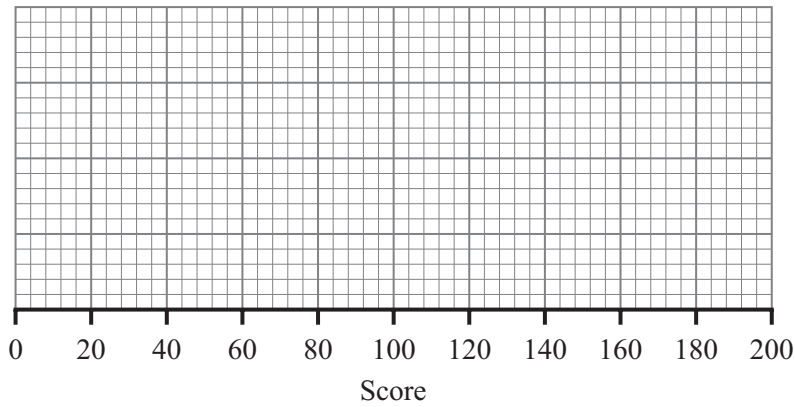
Answer \_\_\_\_\_ [2]

Examiner Only	
Marks	Remark



(b) From the graph draw a box plot.

[3]



Examiner Only	
Marks	Remark

Examiner Only	
Marks	Remark

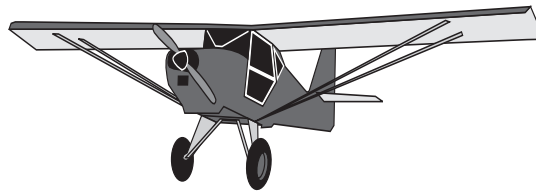
4 (a) Simplify  $\frac{2}{3c} - \frac{1}{4c}$

Answer \_\_\_\_\_ [2]

(b) Factorise  $4x^2 - 25y^2$

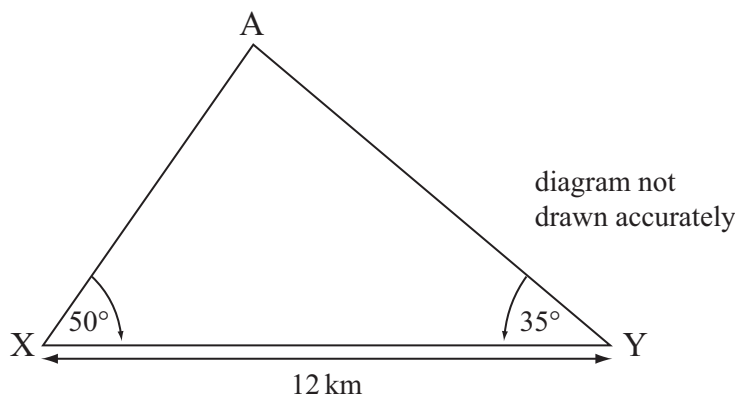
Answer \_\_\_\_\_ [2]

5 A small aircraft, located at position A in the sketch diagram, develops an engine fault while flying between two landing strips located at positions X and Y in the diagram.



The angles from X and Y to the aircraft are  $50^\circ$  and  $35^\circ$  respectively. The aircraft must land as quickly as possible. How much closer is X than Y from A?

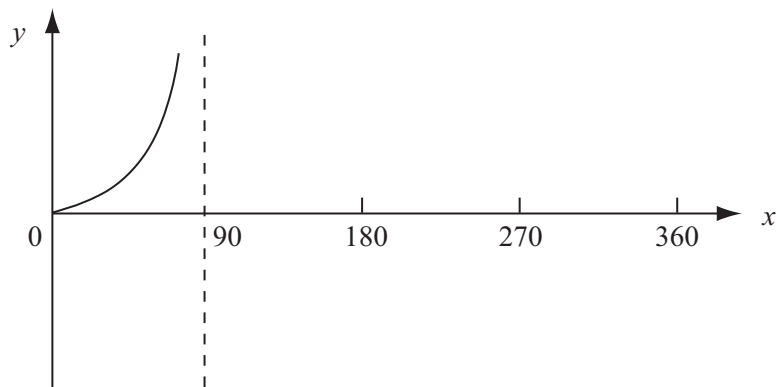
**Show all working.**



Answer \_\_\_\_\_ km [4]



7 (a) Complete this sketch for  $y = \tan x^\circ$  for  $0 \leq x \leq 360$



[1]

(b) Solve the equation

$$3 \tan x^\circ = 4 \quad \text{for } 0 \leq x < 360$$

Answer \_\_\_\_\_ [2]

Examiner Only	
Marks	Remark



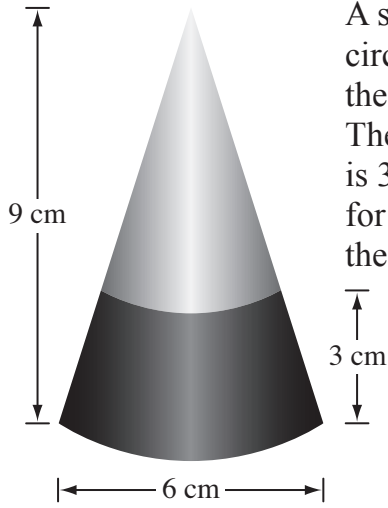


9 Simplify  $\frac{x^2 + 3xy - 5x - 15y}{2x^2 - 10x}$  fully.

Examiner Only	
Marks	Remark

Answer \_\_\_\_\_ [4]

10



A solid paper weight is made in the shape of a right circular cone. Its height is 9 cm and the diameter of the base is 6 cm.

The top section is glass and the base section, which is 3 cm high, is made of metal which weighs 14 g for each cubic centimetre. Calculate the weight of the metal in the base.

Examiner Only	
Marks	Remark

Answer \_\_\_\_\_ g [5]

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**THIS IS THE END OF THE QUESTION PAPER**

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