Rewarding Learning

Centre Number	
71	

Candidate Number

General Certificate of Secondary Education
January 2012

Mathematics

Module N3 Paper 2
(With calculator)
Higher Tier

[GMN32]

WEDNESDAY 11 JANUARY
10.30 am–11.30 am

GMN32

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

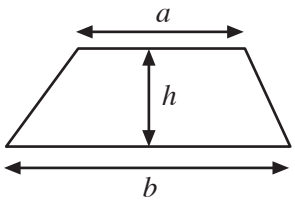
INFORMATION FOR CANDIDATES

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.

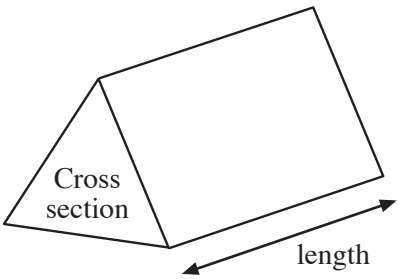
For Examiner's use only	
Question Number	**Marks**
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
Total Marks	

Formula Sheet

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



Volume of prism = area of cross section × length

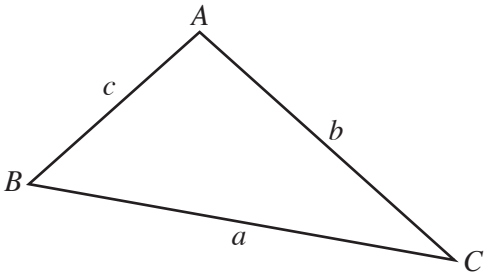


In any triangle ABC

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

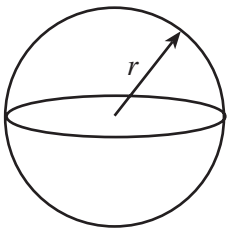
Sine rule : $\dfrac{a}{\sin A} = \dfrac{b}{\sin B} = \dfrac{c}{\sin C}$

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



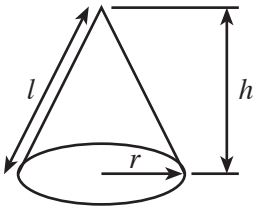
Volume of sphere $= \frac{4}{3}\pi r^3$

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

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

Examiner Only	
Marks	Remark

1 **(a)** Calculate $\dfrac{6.5 \times 5.8}{5.3 + 2.1}$

Give your answer correct to 2 decimal places.

Answer _____ [2]

(b) An investor bought shares for £3 600.

He sold them for 40% profit.

What was his selling price?

Answer £ _____ [3]

Examiner Only	
Marks	Remark

2 Work out the value of x in the quadrilateral below.

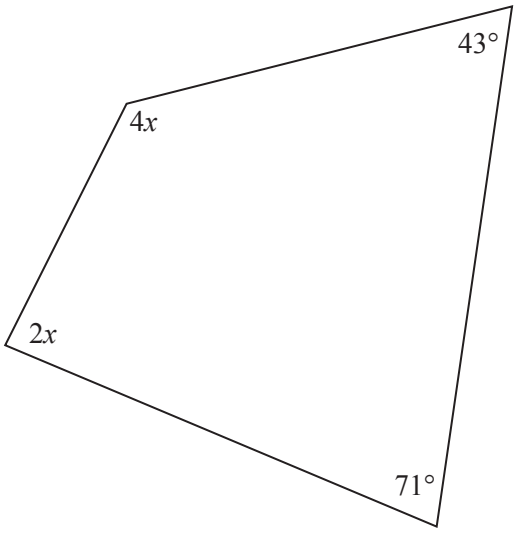


Diagram not drawn accurately

Answer $x =$ _____° [4]

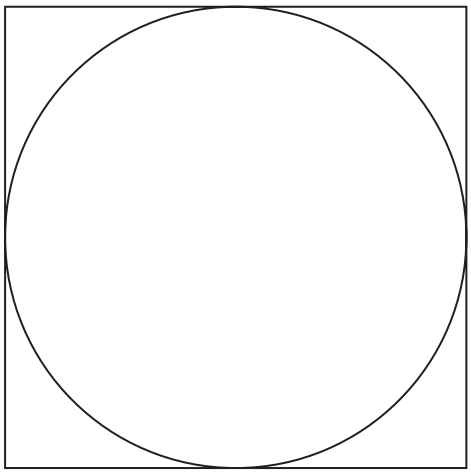
3 In April last year, it rained on 24 days.

What percentage of days in April were dry?

Answer _____% [2]

4 A square of side 8 cm has a circle drawn inside it which just touches its four sides.

Calculate the area of the circle.



Not drawn to scale

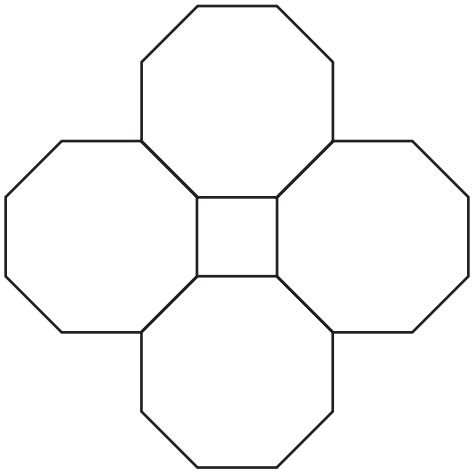
Answer _____ [3]

Examiner Only	
Marks	Remark

5 **(a)** Calculate the size of the interior angle in a regular octagon.

Answer _____° [2]

(b) Four floor tiles, each in the shape of a regular octagon are placed together as shown. Explain why the shape between them must be a square.



Answer _____

_____ [2]

Examiner Only

Marks	Remark

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(Questions continue overleaf)

6 The table shows information about the number of hours that 100 children used a computer for last week.

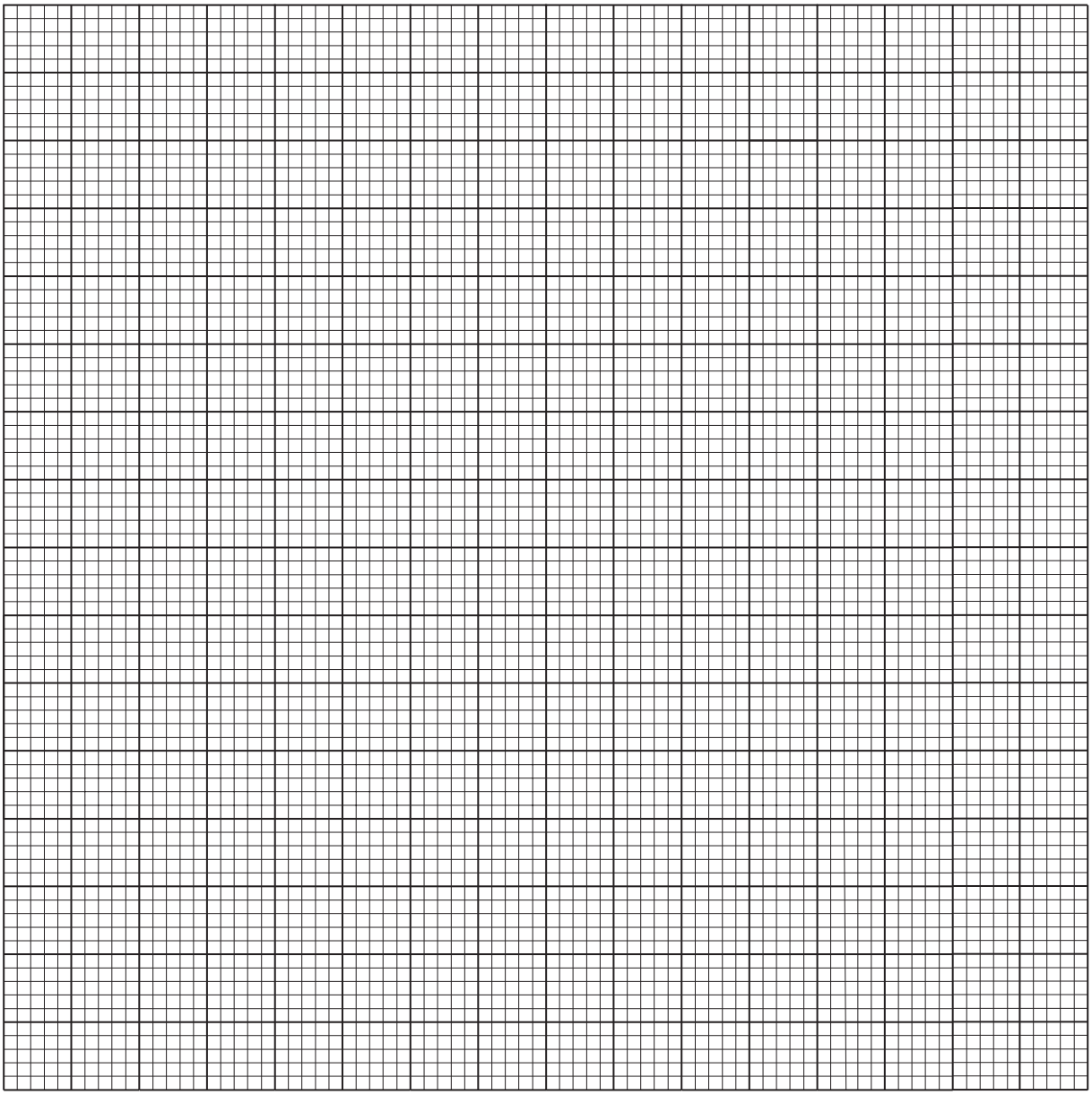
Number of hours (H)	Frequency
$0 < H \leq 3$	8
$3 < H \leq 6$	16
$6 < H \leq 9$	21
$9 < H \leq 12$	36
$12 < H \leq 15$	12
$15 < H \leq 18$	7

(a) Work out an estimate for the mean number of hours that the children used a computer for last week.

Answer _____ hours [4]

Examiner Only	
Marks	Remark

(b) On the grid below draw a frequency polygon to illustrate the data opposite.



[2]

Examiner Only	
Marks	Remark

7 A solution to the equation $x^3 - 5x = 27$ lies between 3 and 4.

Use trial and improvement to find this solution.

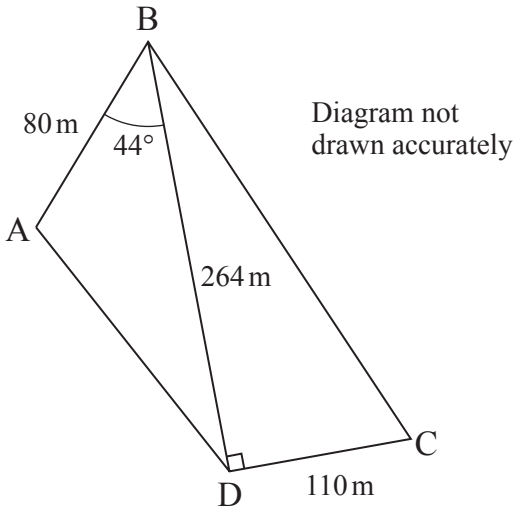
Give your answer correct to 1 decimal place.

Show each stage of your working.

Answer $x =$ _____ [3]

Examiner Only	
Marks	Remark

8 A field ABCD has straight sides. AB = 80 m, DC = 110 m and BD = 264 m. Angle BDC = 90° and angle ABD = 44°.



(a) Calculate the length of BC.

Answer _____ m [3]

(b) Calculate angle ABC.

Answer _____° [3]

Examiner Only

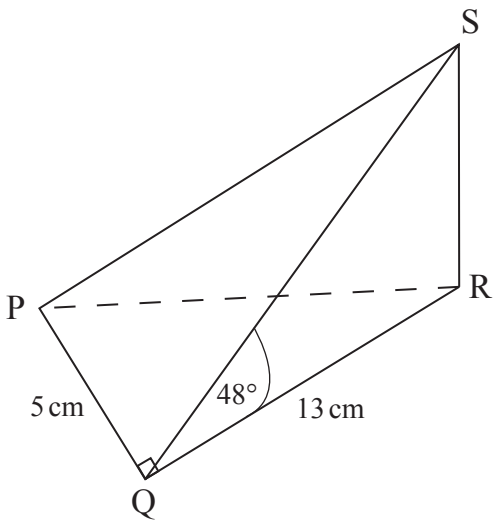
Marks	Remark

Examiner Only	
Marks	Remark

9 Solve the simultaneous equations $7x + 3y = 15$
$4x - y = 14$

Answer $x =$ _____ , $y =$ _____ [3]

10 The diagram shows a pyramid PQRS in which RS is at right angles to the horizontal base PQR. PQ = 5 cm, QR = 13 cm, angle PQR = 90° and angle RQS = 48°.



Calculate the length SR.

Answer _____ cm [3]

Examiner Only	
Marks	Remark

11 An electric fire cost £135.66 including VAT at 20%.

How much VAT was payable on the bill?

Answer £ _____ [3]

12 The temperature in a cooling furnace falls by 5% every hour.

The temperature is measured every hour.

At 10 am the temperature is 1200 °C.

At what hour will it first be found to measure below 1000 °C?

Show your working.

Answer _____ [2]

THIS IS THE END OF THE QUESTION PAPER

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