



Rewarding Learning

General Certificate of Secondary Education

Centre Number

--	--	--	--	--

Candidate Number

--	--	--	--	--

Mathematics

Unit M7 Paper 1
(Non-Calculator)

Higher Tier



[GMC71]
Assessment

GMC71

TIME

1 hour 15 minutes.

Assessment Level of Control:

Tick the relevant box (✓)

Controlled Conditions	
Other	

INSTRUCTIONS TO CANDIDATES

Write your Centre Number and Candidate Number in the spaces provided at the top of this page.

You must answer the questions in the spaces provided.

Do not write outside the boxed area on each page, on blank pages or tracing paper.

Complete in black ink only. **Do not write with a gel pen.**

Answer **all seventeen** questions.

All working should be clearly shown in the spaces provided. 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 50.

Figures in brackets printed down the right-hand side of pages indicate the marks awarded to each question or part question.

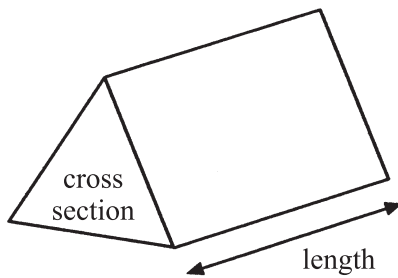
You should have a ruler, compasses and a protractor.

The Formula Sheet is on page 2.

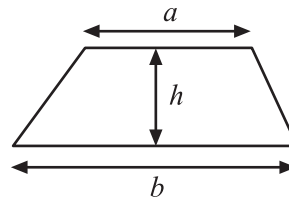


Formula Sheet

Volume of prism = area of cross section \times length

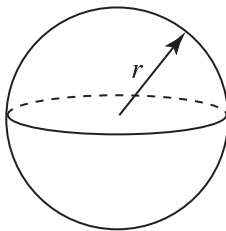


Area of trapezium = $\frac{1}{2}(a+b)h$



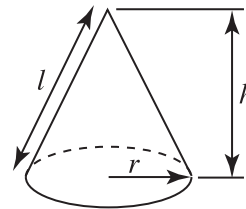
Volume of sphere = $\frac{4}{3}\pi r^3$

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

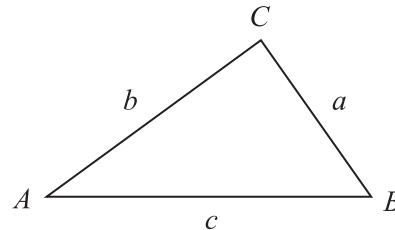


Volume of cone = $\frac{1}{3}\pi r^2 h$

Curved surface area of cone = $\pi r l$



In any triangle ABC



Quadratic Equation

The solutions of $ax^2 + bx + c = 0$
where $a \neq 0$, are given by

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

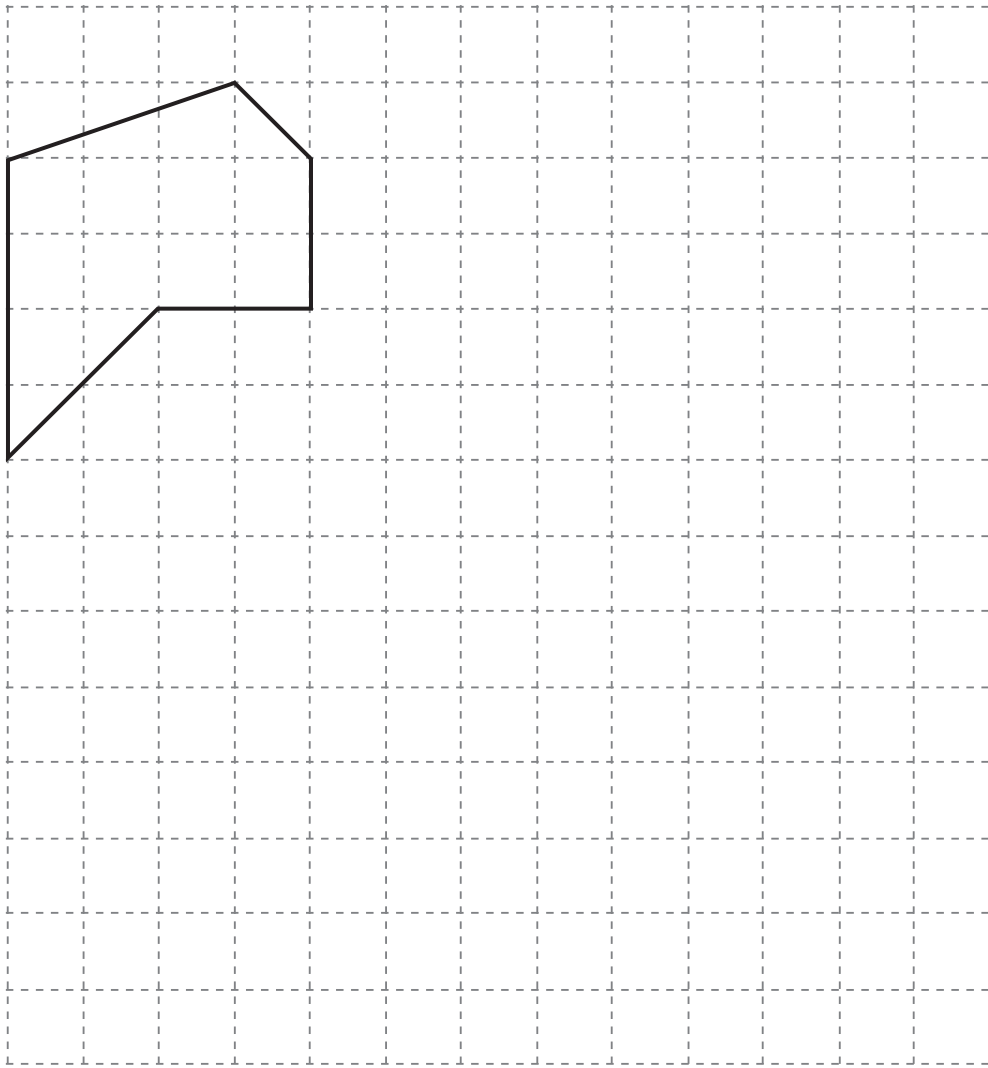
Sine Rule: $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

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

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



1 (a) On the grid, enlarge the shape with a scale factor of 2



[2]

(b) How many times bigger is the area of the enlarged shape than the smaller shape?

Answer _____ [2]

[Turn over



2 Which of the numbers below shows that the following statement is not true?

“If P is any odd number, then $P + 2$ is always a prime number.”

Show all working before you tick the correct box.

P = 1

P = 5

P = 3

P = 7

[2]

3 Change 20 miles/h to km/h.

Answer _____ km/h [2]



4 In a Year 12 class, the following information was recorded.

	Boys	Girls
Wears glasses	3	5
Does not wear glasses	10	6

(a) What fraction of the pupils in the class wear glasses?

Answer _____ [2]

(b) A pupil was chosen at random from the class.

What is the probability that the pupil was a boy who does not wear glasses?

Answer _____ [1]

(c) The next week a new boy joins the class.

He wears glasses.

Will this change the probability of now choosing at random a girl who wears glasses?

Explain your answer clearly.

Answer _____ because _____ [2]

[Turn over



5 Sam and Julie share £35 in the ratio 6 : 1

How much is each share?

Answer Sam £ _____

Julie £ _____ [2]



6 “Look Dad,” said Erin.

“Here are all the silver coins from my piggy bank.”

“How much have you got?” said Dad.

“ $\frac{1}{3}$ are 5p coins, $\frac{1}{4}$ are 10p coins and the other 10 coins are 50p coins,” said Erin.

What is Erin’s total amount of money?

Show all working.

Answer _____ [5]

[Turn over



7 ABCDE is a pentagon.

Lines AF and CG are straight lines.

Work out the value of $x + y + z$

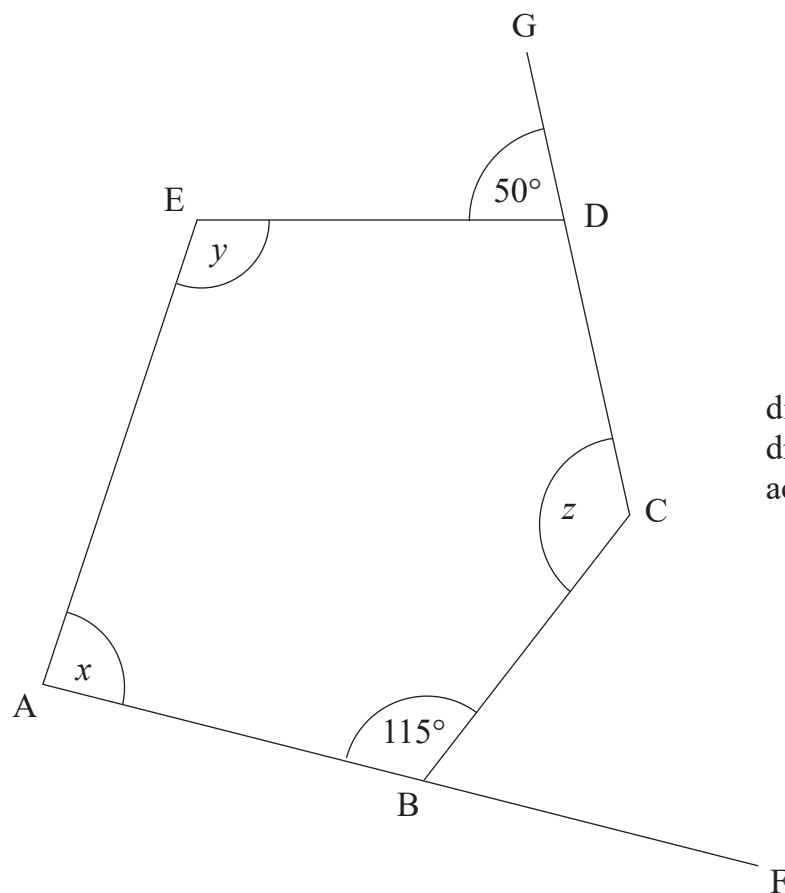


diagram not
drawn
accurately

Answer _____ $^\circ$ [5]



8 Simplify each of the following.

(a) $4p^3 \times 3p^4$

Answer _____ [1]

(b) $(q^2)^3 \div q^8$

Answer _____ [1]

9 Find the n th term of the sequence

7, 4, 1, -2,

Answer n th term = _____ [2]

[Turn over



10 Tony tests a six-sided dice which he thinks is biased towards the even numbers.

He carries out an experiment by rolling the dice.

He records the results as E (even) or O (odd).

E O E O E E O E E O E O

(a) What is the relative frequency of an even number?

Answer _____ [1]

(b) How could Tony improve the experiment?

Answer _____ [1]

11 Make y the subject of

$$3y - 12 = 4x$$

Answer $y =$ _____ [2]



12 A rectangle has a length of $3x$ cm and a width of $(x + 5)$ cm.

The length is greater than the width.

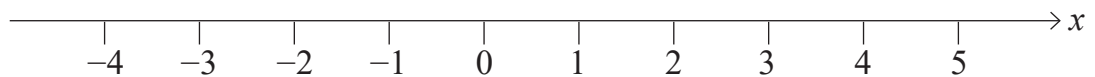
(a) Write this information as an inequality in x .

Answer _____ [1]

(b) (i) Solve the inequality.

Answer _____ [1]

(ii) Show your answer on the number line below.



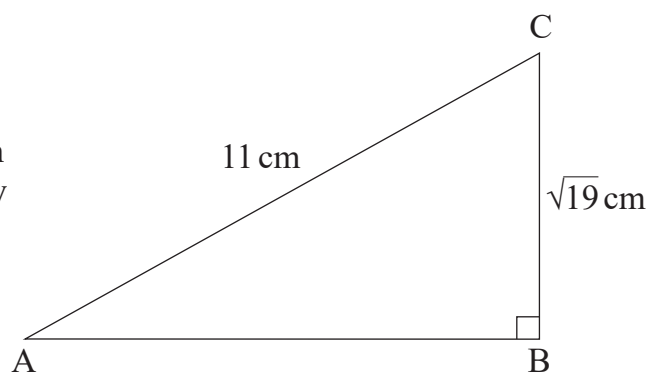
[1]

[Turn over



13

diagram
not drawn
accurately

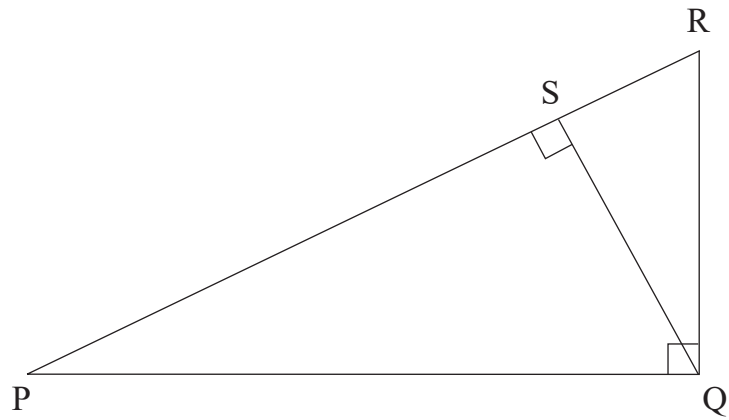


ABC is a right-angled triangle.

Work out the length of AB, giving your answer as a surd.

Answer _____ cm [3]





PQR is a right-angled triangle and QS is the perpendicular line from Q to PR .

Prove that the triangles PQR and QSR are similar.

[3]

[Turn over



Special Menu

Two Courses (starter and main
or main and dessert) £15.95

Starters

Soup of the Day
Caesar Salad
Baked Brie
Bruschetta

Mains

Fish of the Day
Chicken Kiev
Pork Medallions
Ribeye Steak (£3 supplement)
Spaghetti Bolognese

Desserts

Cheesecake
Apple Pie
Ice Cream

A restaurant has the above Special Menu available.

How many different ways are there of choosing two courses (starter and main or main and dessert)?

Answer _____ [3]



16 Re-arrange the formula to make r the subject.

$$V = \frac{4}{3}\pi r^3$$

Answer _____ [2]

17 The height of a balloon, h , varies directly as the square root of its surface area, A .

When the balloon's surface area is 81 its height is 12

What is its height when its surface area is 144?

Answer _____ [3]

THIS IS THE END OF THE QUESTION PAPER



DO NOT WRITE ON THIS PAGE

For Examiner's use only	
Question Number	Marks
1	
2	
3	
4	
5	
6	
7	
8	
9	
10	
11	
12	
13	
14	
15	
16	
17	

Total Marks	
--------------------	--

Examiner Number

Permission to reproduce all copyright material has been applied for.
In some cases, efforts to contact copyright holders may have been unsuccessful and CCEA will be happy to rectify any omissions of acknowledgement in future if notified.

12376/2



16GMC7116