

Pre Public Examination
November 2016
GCSE Mathematics (AQA style)

Higher Tier
Paper 2H

Name

Class

TIME ALLOWED

1 hour 30 minutes

INSTRUCTIONS TO CANDIDATES

- Answer **all** the questions.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- You are permitted to use a calculator in this paper.
- You may use the π button on your calculator or you may take the value of π to be 3.142.
- Do all rough work in this book.

INFORMATION FOR CANDIDATES

- The number of marks is given in brackets [] at the end of each question or part question on the Question Paper.
- **You are reminded of the need for clear presentation in your answers.**
- The total number of marks for this paper is 80.

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Question	Mark	out of
1		1
2		3
3		7
4		1
5		3
6		3
7		3
8		3
9		4
10		3
11		5
12		4
13		3
14		4
15		4
16		3
17		7
18		3
19		6
20		4
21		6
Total		80

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ANSWER IN THE SPACES PROVIDED**

Answer **all** questions in the spaces provided

1 Which of these numbers is closest to 1?

Circle your answer.

0.9

0.89

1.05

1.1

[1 mark]

2 Amelie is x years old.

2 (a) Ben is twice as old as Amelie.
Write an expression for Ben's age.

[1 mark]

Answer _____

2 (b) Sam is 3 years older than Ben.
Write an expression for Sam's age.

[1 mark]

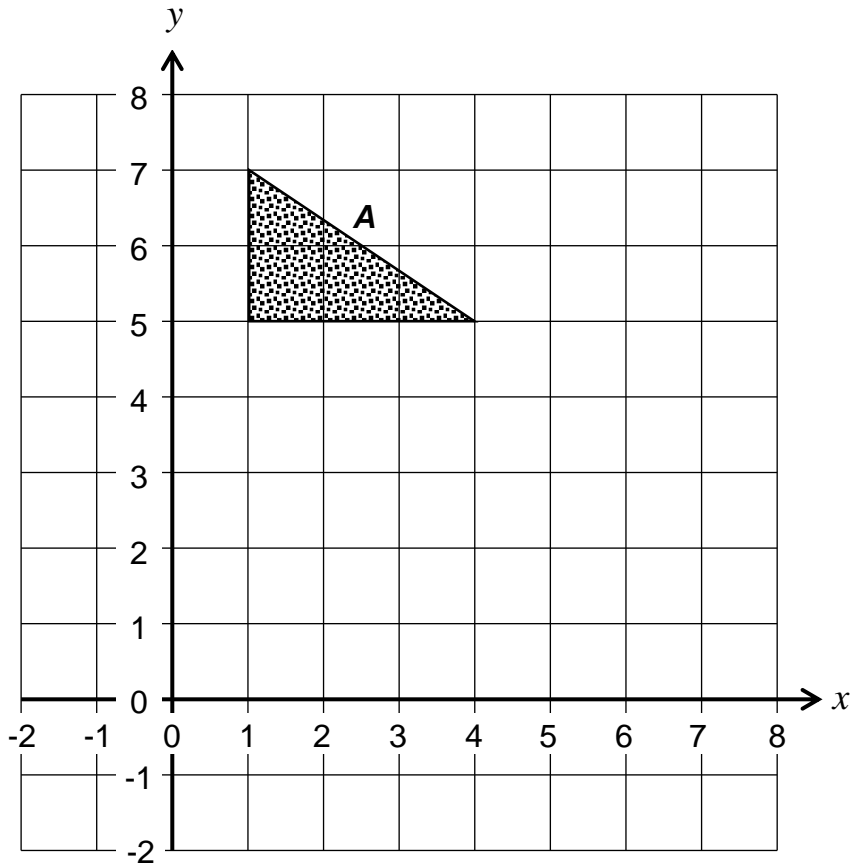
Answer _____

2 (c) James is half Sam's age.
Write an expression for James's age.

[1 mark]

Answer _____

3



3 (a) Reflect triangle A in the line $y = x$.
Label your new triangle B

[2 marks]

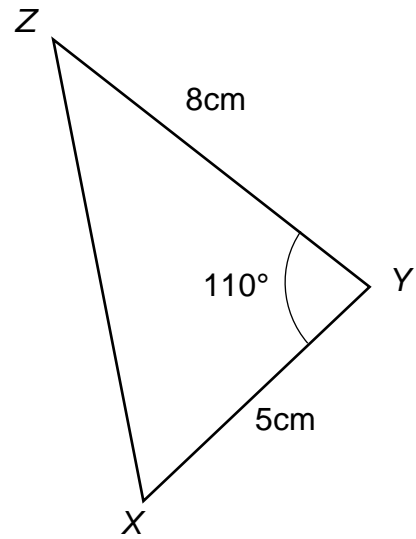
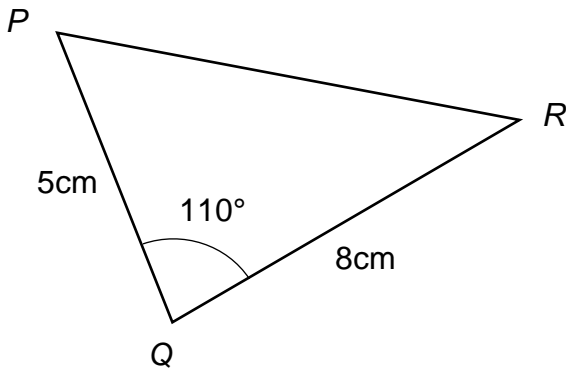
3 (b) Reflect triangle B in the line $x = 4$. Label your new triangle C.

[2 marks]

3 (c) Describe fully the single transformation that moves triangle A to triangle C

[3 marks]

4 Triangles PQR and XYZ are congruent.



Which of these abbreviations indicates the reason you know they are congruent?

Circle your answer.

AAA

ASA

RHS

SAS

[1 mark]

5 Mrs Holloway needs to fill up her car with petrol.
Her car's fuel tank can hold 50 litres. There are already 12 litres of fuel in her tank.
Fuel costs 107.9p per litre.
Mrs Holloway gets 2 loyalty points for every full pound she spends on fuel.

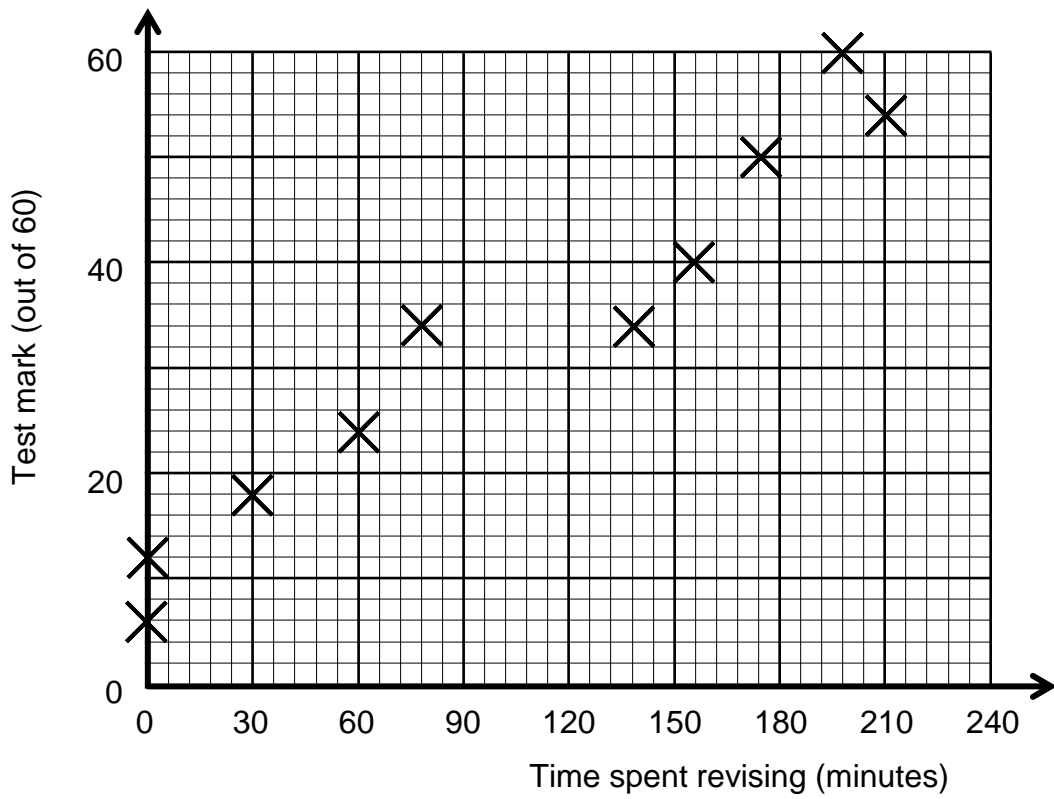
How many loyalty points does Mrs Holloway get once she has filled up her tank?

Show all your working.

[3 marks]

Answer _____

- 6 A tutor asked ten pupils how long they had spent preparing for a test. He used a scatter diagram to compare their answers with the marks they obtained on the test.



- 6 (a) The scatter diagram shows a positive correlation.

Describe the relationship between the amount of time spent revising and the mark a student obtained in the test.

[1 mark]

- 6 (b) Use the scatter diagram to estimate the score that the tutor would expect if a pupil studied for two hours.

[2 marks]

Answer _____

7 In a school canteen 40% of the customers are female.

25% of the females are vegetarian
32% of the males are vegetarian

What is the percentage of customers that are vegetarian?

[3 marks]

Answer _____

8 The density of titanium is 4.5 g per cm³
The volume of a block of metal is 20 cm³
Its mass is 89.5 g

Could the metal from which the block is made be titanium?

Tick a box.

Show your working.

It could be titanium It can't be titanium

[3 marks]

9 The number of people in each of 50 cars is summarised in the table.

Number of people in a car	Number of cars
1	17
2	15
3	
4	
5	6
6 or more	0

The mean number of people in each car is 2.4.

How many cars had 3 people in them?

[4 marks]

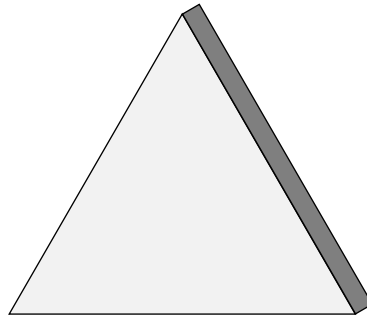
Answer _____ cars

10 A square has sides of length $(6x + 3)$ cm and $2(4x - 1)$ cm.
Find the length of one of its sides.

[3 marks]

Answer _____ cm

12



The front of a plastic badge is made in the shape of a prism, whose cross section is an equilateral triangle.

The perimeter of the triangle is 15cm.
The thickness of the badge is 0.3cm.

What is the volume of plastic needed to make the badge?

[4 marks]

Answer _____ cm³

13 The n th term of a sequence is $n^2 + 2n$.

After how many terms in the sequence does the value of the term first exceed 70?

[3 marks]

Answer _____

14 Jemima invested some money at the start of 2012.
She has forgotten the exact amount but she remembers that, to the nearest £1 000, it was £12 000.

In 2013 Jemima received 4% interest, to the nearest 1%.
In 2014 she received 5% interest, again to the nearest 1%.

What is the lowest possible value of her investment at the end of 2014?

[4 marks]

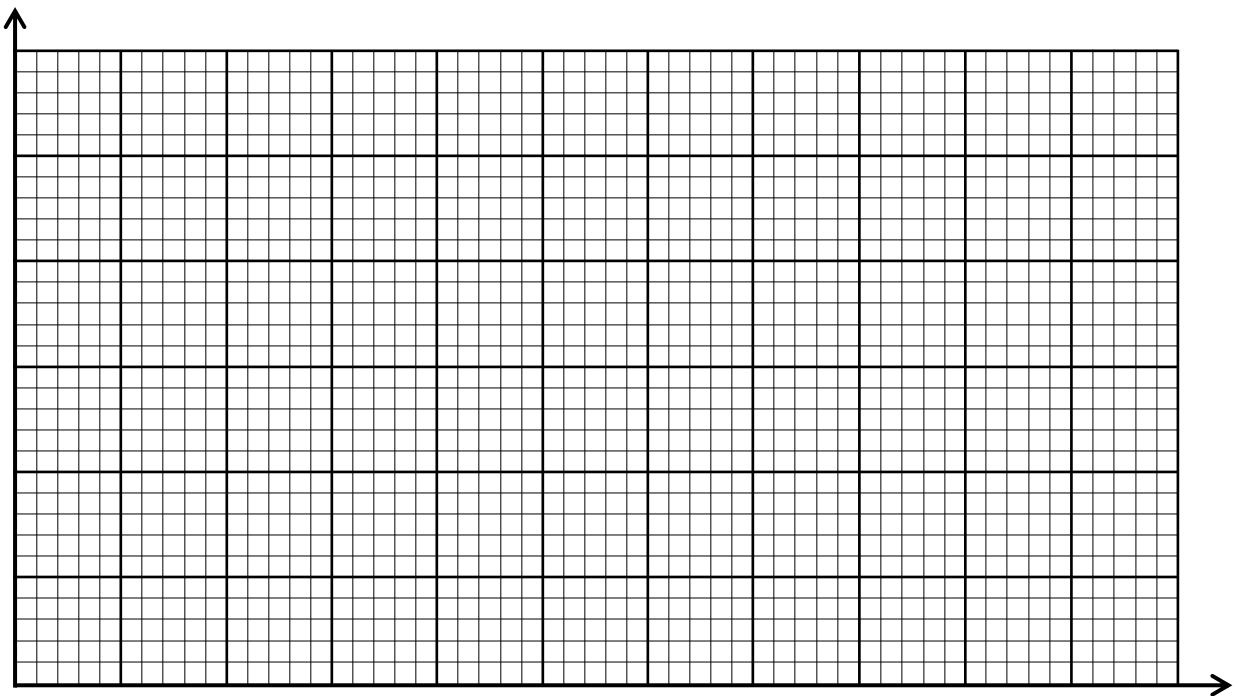
Answer £ _____

- 15 Pupils in Year 7 planted seedlings. After one month they measured the heights of the seedlings. The table shows the results.

Height (h cm)	Frequency
$0 < h \leq 30$	6
$30 < h \leq 40$	10
$40 < h \leq 50$	8
$50 < h \leq 60$	6
$60 < h \leq 80$	5
$80 < h \leq 100$	3

Represent this information using a histogram.

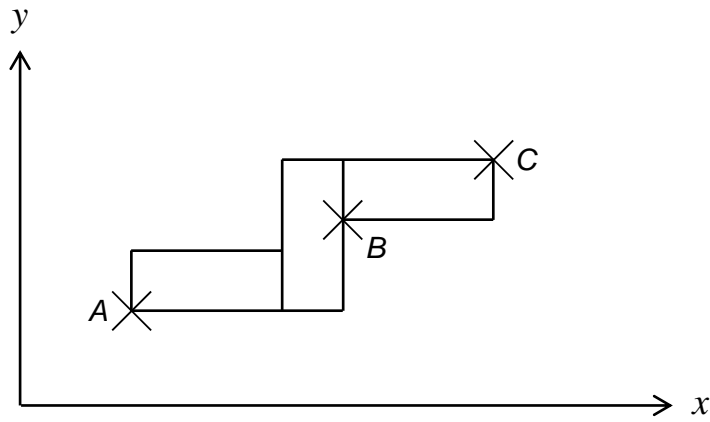
[4 marks]



16 The diagram shows three identical rectangles.

The co-ordinates of point A are $(4, 3)$.

The co-ordinates of point C are $(17, 9)$.



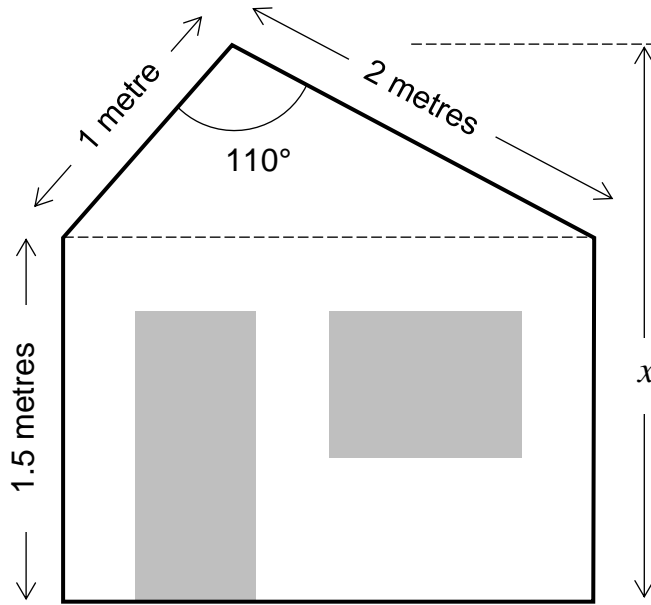
Not drawn accurately

Find the coordinates of point B .

[3 marks]

Answer (_____ , _____)

- 17 The front of a Wendy House is made of a rectangular wall panel and a triangular roof section.



Not drawn accurately

- 17 (a) Calculate the area of the roof section.

[2 marks]

Answer _____ m^2

- 17 (b) Calculate the width of the Wendy house.

[3 marks]

Answer _____ m

17 (c) Hence, or otherwise, calculate the total height of the Wendy House, from the floor to the top of the roof, marked x , to the nearest centimetre.

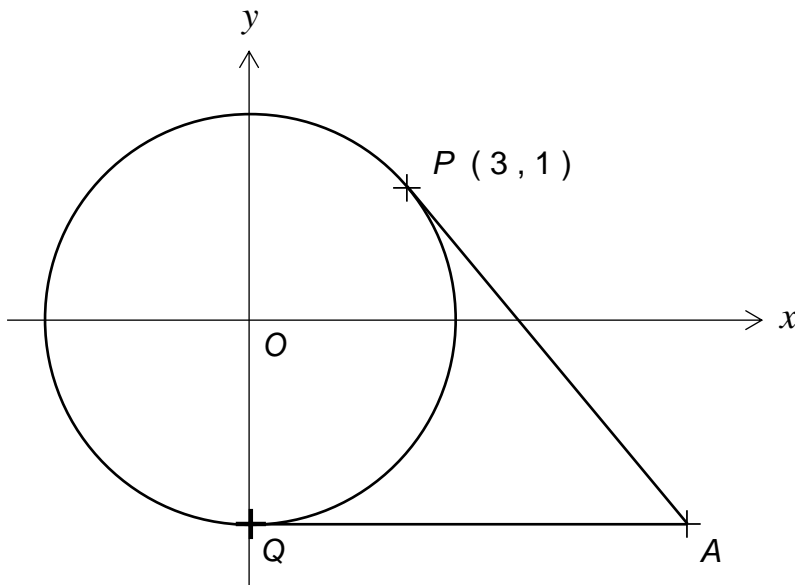
[2 marks]

Answer _____ m

18 Prove, algebraically, that the difference between the squares of two consecutive integers is always equal to the sum of the two integers.

[3 marks]

19



Not drawn accurately

The diagram shows the circle, centre O , with equation $x^2 + y^2 = 10$.

Points P and Q lie on the circle.

Point Q also lies on the y -axis.

The co-ordinates of P are $(3, 1)$.

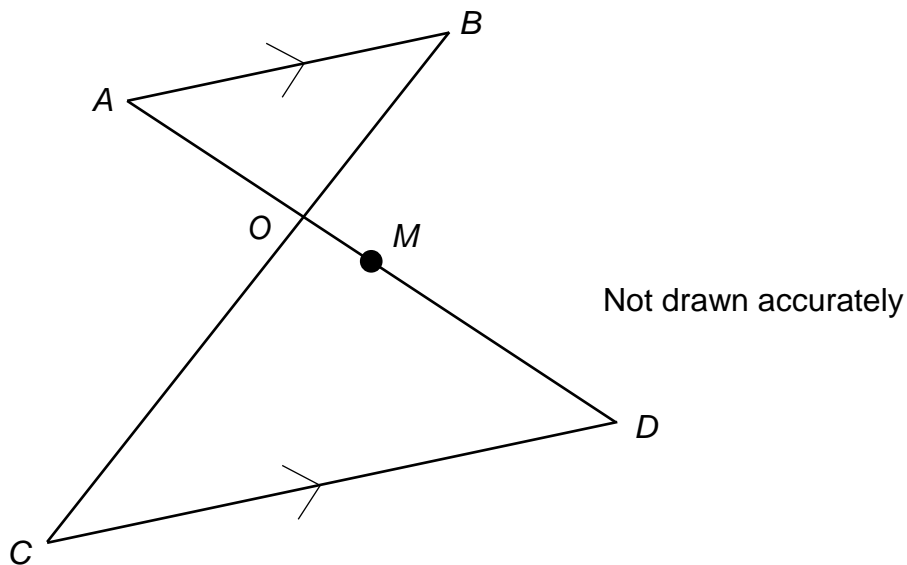
AQ and AP are tangents to the circle.

Find the co-ordinates of point A , giving your answers in surd form.

[6 marks]

Answer (_____ , _____)

20 In the diagram, $\vec{OA} = \mathbf{a}$ and $\vec{OB} = \mathbf{b}$.



20 (a) Write down \vec{AB} in terms of \mathbf{a} and \mathbf{b} .

[1 mark]

Answer _____

20 (b) M is the midpoint of AD .
 COB is a straight line, and $\vec{CO} = 2\vec{OB}$.
 CD is parallel to AB .

What is \vec{MC} in terms of \mathbf{a} and \mathbf{b} ?

[3 marks]

Answer _____

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