

Surname	
Other Names	
Candidate Signature	

Centre Number						Candidate Number				
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Examiner Comments	

Total Marks

Paper 1H

GCSE MATHEMATICS

CM

Practice Set A (AQA Version) Non-Calculator Time allowed: 1 hour 30 minutes

Instructions to candidates:

- In the boxes above, write your centre number, candidate number, your surname, other names and signature.
- Answer ALL of the questions.
- You must write your answer for each question in the spaces provided.
- You must not use a calculator.

Information to candidates:

- Full marks may only be obtained for answers to ALL of the questions.
- The marks for individual questions and parts of the questions are shown in square brackets.
- There are 18 questions in this question paper. The total mark for this paper is 80.

Advice to candidates:

- You should ensure your answers to parts of the question are clearly labelled.
- You should show sufficient working to make your workings clear to the Examiner.
- Answers without working may not gain full credit.

GCSE/A1H

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1 0 3 3 1 1 1 1 8 0 0 0 5



Answer **all** questions in the spaces provided.

1 Given that $28 \times 342 = 9576$, find the value of $95.76 \div 280$.

Circle your answer.

[1 mark]

3.42

34.2

0.342

0.0342

2 Find the circumference of the circle which has area 100π .

Circle your answer.

[1 mark]

10π

40π

20π

200π

3 The first five terms in a sequence are

6

2

-2

-6

10

3 (a) Which of the following terms correctly describes this sequence.

Circle your answer.

[1 mark]

Arithmetic

Fibonacci

Geometric

Harmonic

3 (b) Find the n th term of the sequence.

Circle your answer.

[1 mark]

$4n + 2$

$-4n - 10$

$10 - 4n$

$2 - 4n$



4 Find the value of $12\sqrt{610}$ to two decimal places.

[3 marks]

Answer _____

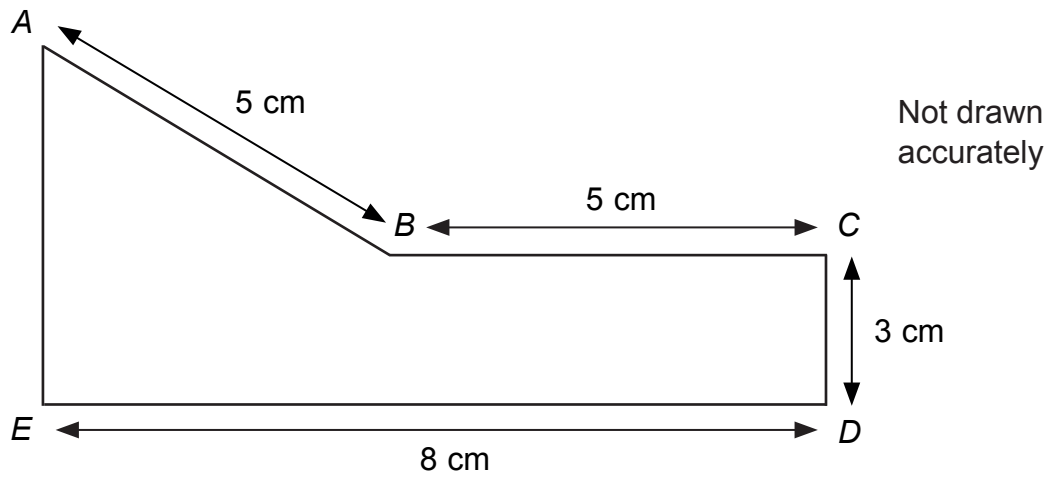
Turn over for the next question

Turn over ►



1 0 3 3 1 1 1 1 8 0 0 0 5

- 5 Marcus has designed an outline for the shape of the cross-section of his conservatory. This outline is shown below.



The diagram shows $AB = BC = 5$ cm

$$CD = 3$$
 cm

$$DE = 8$$
 cm

- 5 (a) Show that the length of AE is 7 cm.

[3 marks]



6 (a) Expand and simplify $(2a + b)(a - b)$.

[2 marks]

Answer _____

6 (b) Simplify $4e^3 f^6 \div 2ef^{-2}$.

[2 marks]

Answer _____

6 (c) Factorise $x^2 + 2x + 1$.

[1 mark]

Answer _____



6 (d) Alice has the number n , where

$$n = x^2 + 2x + 1 \text{ for positive integers } x$$

6 (d) (i) Explain what you understand by the term 'integer'.

[1 mark]

6 (d) (ii) Alice claims that n is a prime number for all x .

Is she correct?

[1 mark]

Turn over for the next question

Turn over ►



1 0 3 3 1 1 1 1 8 0 0 0 5

7 The straight line l has the equation $2y = 2x + 6$.

7 (a) Write down the gradient of l .

[1 mark]

Answer _____

7 (b) Write down the y intercept of l .

[1 mark]

Answer _____

7 (c) (i) Is the line with equation $2x + 2y + 3 = 0$ parallel to l ?

Explain your answer.

[1 mark]

7 (c) (ii) Write down the number of solutions to the simultaneous equations

$$2y = 2x + 6$$

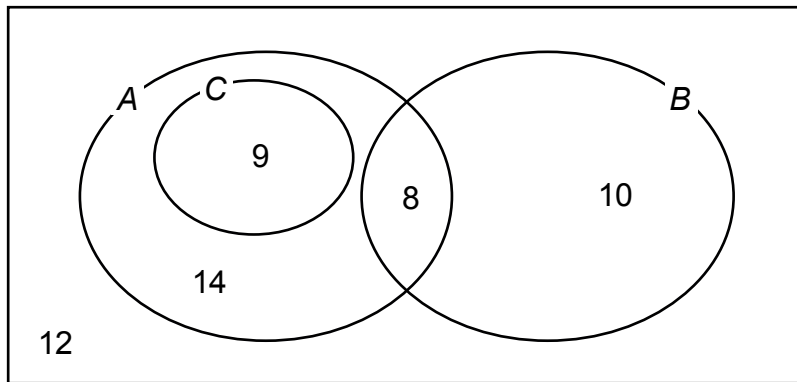
$$2x + 2y + 3 = 0$$

[1 mark]

Answer _____



- 8 The Venn diagram shows the number of observations of the events A , B and C .



- 8 (a) Are the events B and C mutually exclusive?

Explain your answer.

[1 mark]

- 8 (b) Write down the number of times just the event B was observed.

[1 mark]

Answer _____

- 8 (c) Write down the number of times just the event A was observed.

[1 mark]

Answer _____

- 8 (d) Given that C was observed, state the probability that A was observed.

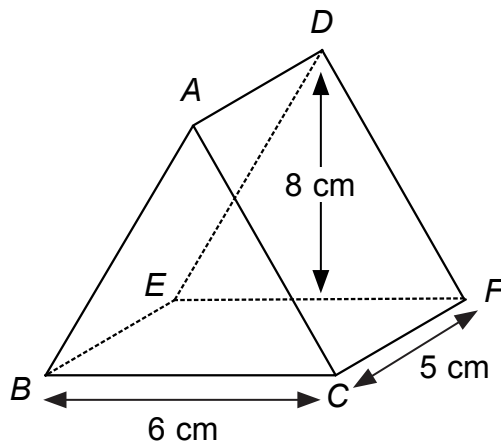
[1 mark]

Answer _____

Turn over ►



- 9 The diagram below shows the prism $ABCDEF$.



Not drawn accurately

The mass of the prism is 0.288 kg.

Annabelle needs to identify the solid that the prism is made from.

Here is a list of the possible solids and their densities.

Solid	A	B	C
Density (g / cm^3)	2.4	0.4	4.8

Find the solid the prism is made out of.

You should show your working clearly.

[4 marks]



9 [Extra space]

Solid _____

Turn over for the next question

Turn over ►



1 0 3 3 1 1 1 1 8 0 0 0 5

10 Two integers are said to be coprime if the only positive integer that divides both of them is 1.

10 (a) Give an example of two integers that are coprime.

[1 mark]

Answer _____

10 (b) Express the ratio

$$3\frac{3}{4} : 3\frac{1}{8}$$

in the form $a:b$, where a and b are coprime.

[3 marks]

Answer _____



11 A test has 40 questions and has a total score of 170 marks.

The test consists of written questions each worth 3 marks
 multiple choice questions each worth 5 marks

How many written and multiple choice questions are there in the test?

[5 marks]

number of written questions = _____

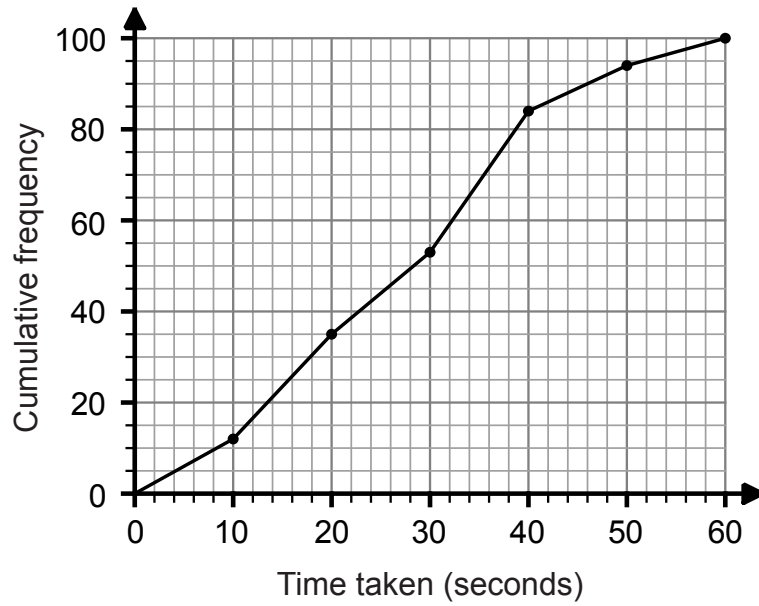
number of multiple choice questions = _____

Turn over ►



1 0 3 3 1 1 1 1 8 0 0 5

- 12** Jenny records the times taken for 100 runners to complete a race. Her data is shown in the cumulative frequency diagram below.



- 12 (a)** Complete the frequency table below for Jenny's data.

[2 marks]

Time (t seconds)	Frequency
0 – 10	12
10 – 20	
20 – 30	18
30 – 40	31
40 – 50	10
50 – 60	



12 (b) Two runners out of the 100 runners are picked at random.

Find the probability that both runners took between 10 and 30 seconds to complete the race.

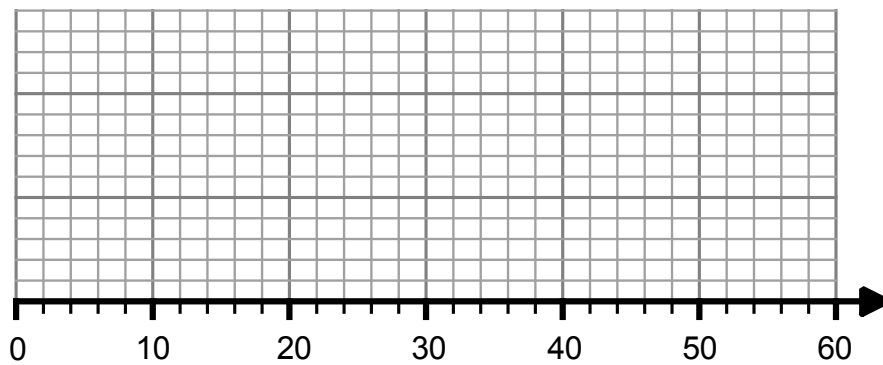
[3 marks]

Answer _____

12 (c) The longest time someone took to complete the race was 54 s and the shortest time was 8 s.

On the axes below, draw a box plot for Jenny's data.

[3 marks]

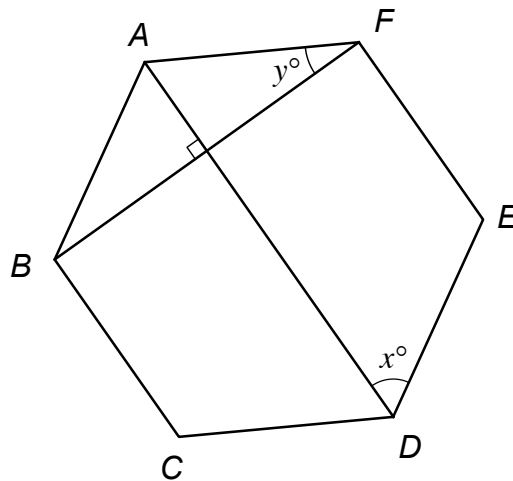


Time taken (seconds)

Turn over ►



- 13 The diagram below shows a regular hexagon $ABCDEF$.



Not drawn accurately

The angle $ADE = x^\circ$.

The angle $AFB = y^\circ$.

- 13 (a) Find the value of x .

[2 marks]

Answer _____

- 13 (b) Given that $AF = 10$ cm, find the length of BF .

[5 marks]



13 (b) [Extra space]

Answer _____ centimetres

Turn over ►



- 14** Emily is studying a colony of bacteria.
The number of bacteria in the colony triples every hour.
She needs help to predict the number of bacteria, a_n , in the colony after n hours.

14 (a) Write down a suitable iterative formula, in terms of a_n , for Emily.

[1 mark]

Answer _____

14 (b) Interpret the meaning of a_0 in this context.

[1 mark]

14 (c) Emily uses 100 bacteria to begin a new colony.

Use your iterative formula in (a) to predict the number of bacteria in the colony after three hours. You should show your working clearly.

[3 marks]

Answer _____



15 A bag contains red, green and blue balls.

The proportion of red to green balls in the bag is a fifth.

The proportion of green to blue balls in the bag is a quarter.

Two balls are chosen from the bag at random.

Given that the bag contains 26 balls, find the probability that both are green.

[4 marks]

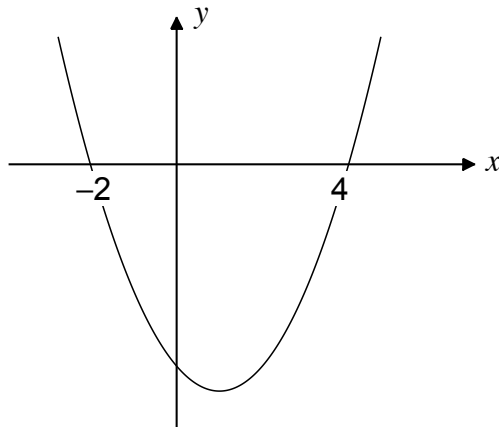
Answer _____

Turn over ►



1 0 3 3 1 1 1 1 8 0 0 0 5

- 16 A graph of the function $y = x^2 + ax + b$ is shown below.



The curve crosses the x axis at $x = -2$ and $x = 4$.

Find the values of a and b .

[3 marks]

$$a = \underline{\hspace{4cm}}$$

$$b = \underline{\hspace{4cm}}$$



17 A function f is defined such that

$$f(x) = \frac{2x+1}{x}$$

17 (a) Find $f^{-1}(x)$.

[2 marks]

Answer _____

17 (b) Find the exact values of x that satisfy $f(x^2 - 5) = 0$.
Give your answers in their simplest form.

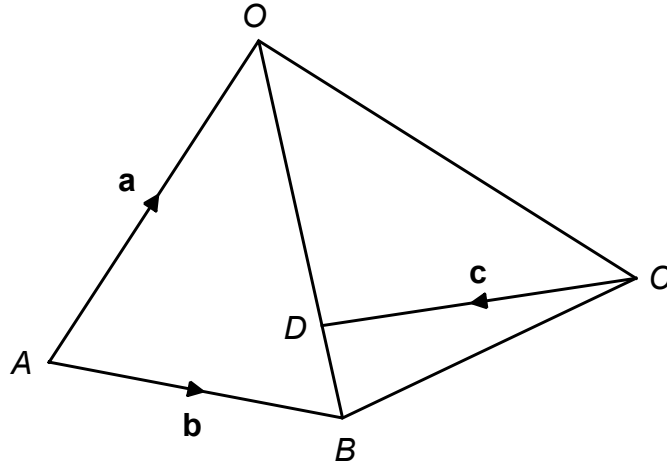
[4 marks]

Answer _____



1 0 3 3 1 1 1 1 8 0 0 0 5

18



In the diagram above, $\overrightarrow{AO} = \mathbf{a}$, $\overrightarrow{AB} = \mathbf{b}$ and $\overrightarrow{CD} = \mathbf{c}$.

The point D lies on the line OB such that $OD : DB = 3 : 1$.

18 (a) Find \overrightarrow{OB} in terms of \mathbf{a} and \mathbf{b} .

[1 mark]

Answer _____

18 (b) Show that \overrightarrow{AC} is parallel to the vector $\mathbf{a} + 3\mathbf{b} - 4\mathbf{c}$.

[4 marks]



18 (b) [Extra space]

END OF QUESTIONS

