Surname	
Other Names	
Candidate Signature	

Centre Number						Candidate Number				

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.

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

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

1 Given that 28 × 342 = 9576, find the value of 95.76 ÷ 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 nth term of the sequence.

Circle your answer.

[1 mark]

$4n + 2$ $-4n - 10$ $10 - 4n$ $2 - 4n$

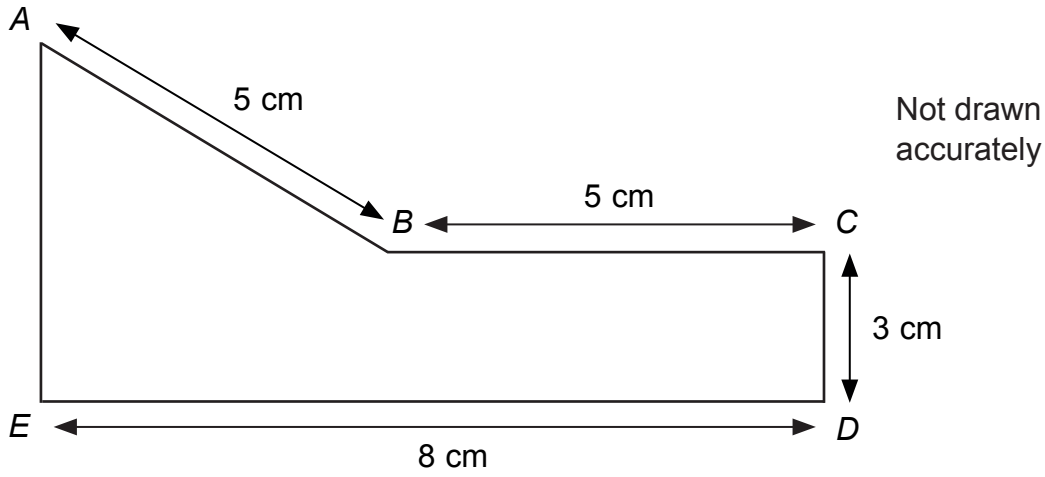
4 Find the value of $12\overline{)610}$ to two decimal places.

[3 marks]

Answer _____

Turn over for the next question

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]

5 (b) Calculate the cross-sectional area of Marcus' conservatory.
Give a suitable unit with your answer.

[4 marks]

Answer _____ units _____

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

[2 marks]

Answer _____

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

[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

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]

_____

_____

_____

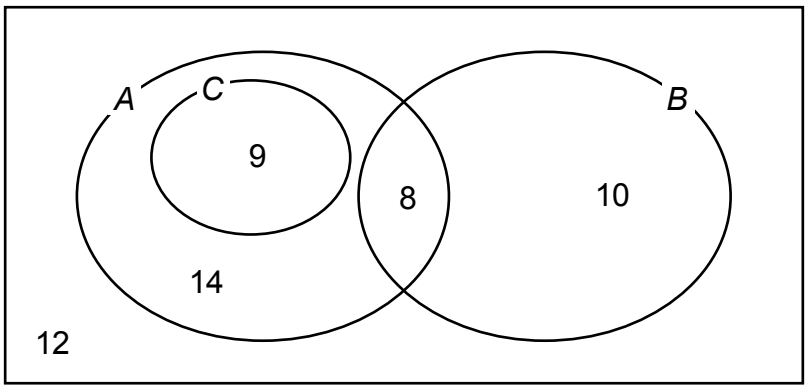
7 (c) (ii) Write down the number of solutions to the simultaneous equations

$$2y = 2x + 6$$
$$2x + 2y + 3 = 0$$

[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]

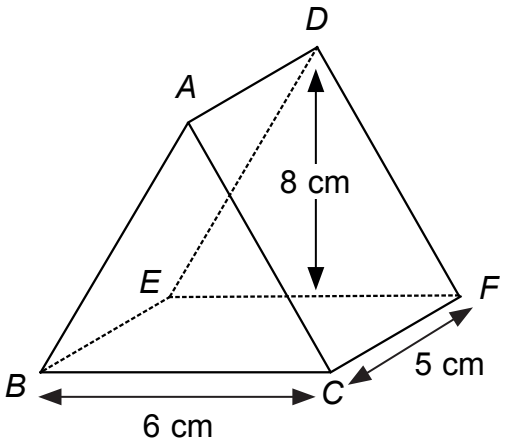
Answer _____

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

[1 mark]

Answer _____

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

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]

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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

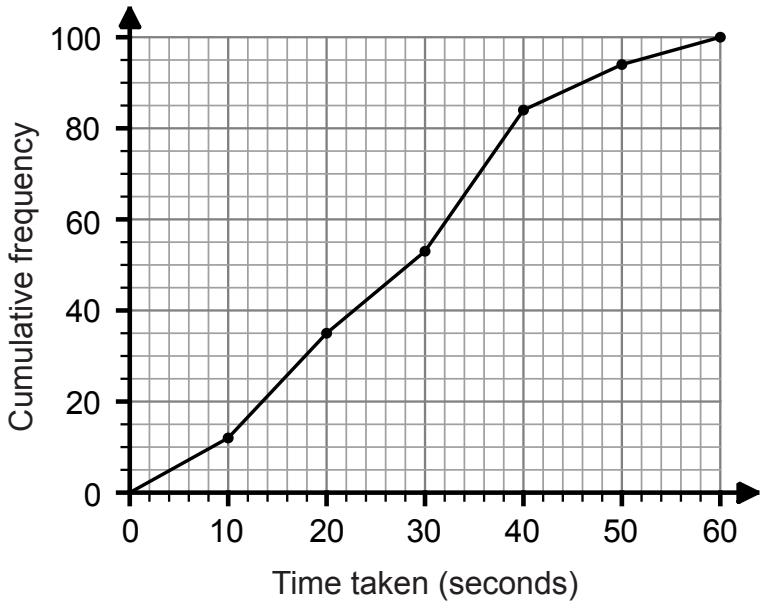
How many written and multiple choice questions are there in the test?

[5 marks]

number of written questions = _____

number of multiple choice questions = _____

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.

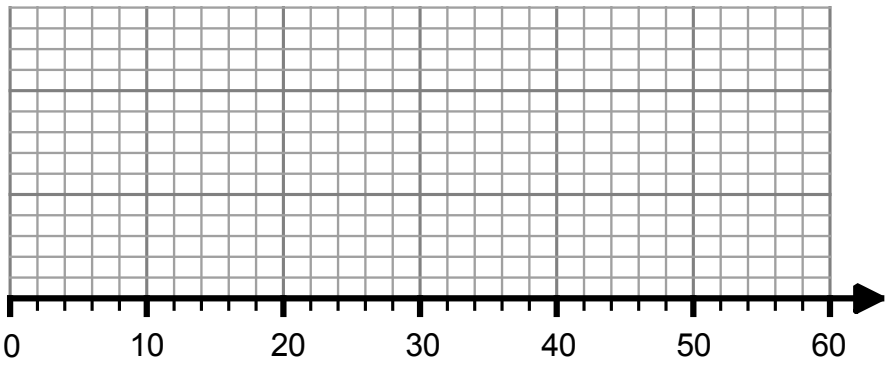
[3 marks]

Answer _____

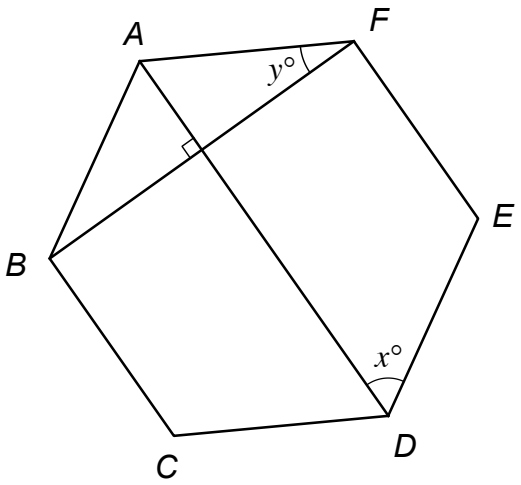
12 (c) The longest time someone took to complete the race was 54 s and the shortest time was 8 s.

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

[3 marks]



13 The diagram below shows a regular hexagon *ABCDEF*.



Not drawn accurately

The angle *ADE* = x°.

The angle *AFB* = y°.

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

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]

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_____

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.

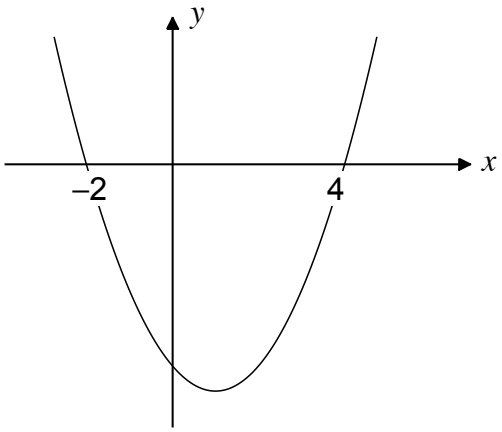
Two balls are chosen from the bag at random.

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

[4 marks]

Answer _____

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]

$a =$ _____

$b =$ _____

17 A function f is defined such that

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

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

[2 marks]

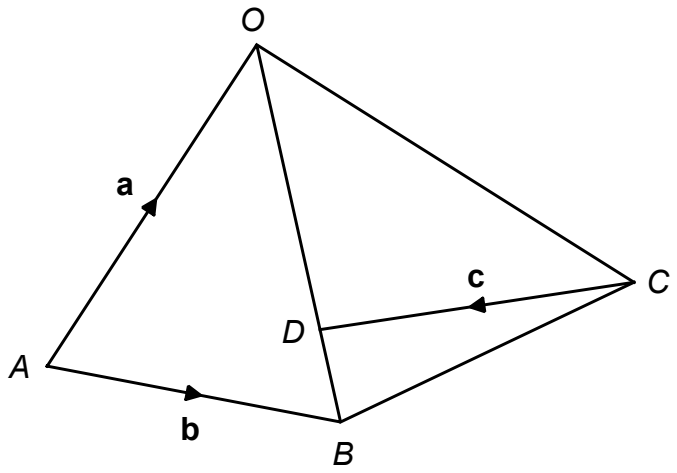
Answer _____

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 _____

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 **a** and **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