

Surname	
Other Names	
Candidate Signature	

Centre Number						Candidate Number				
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Examiner Comments	

Total Marks

PAPER 1H

GCSE MATHEMATICS

CM

Practice Set B

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 round brackets.
- There are 19 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/B1H

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1 0 3 3 1 1 1 2 8 0 0 0 4



Answer ALL questions.

Write your answers in the spaces provided.

You must write down all the stages in your working.

1 A box is on a table.

The area of the box in contact with the table is 1200 cm².

The pressure on the table is 32 newtons/m².

Work out the force exerted by the box on the table.

$$p = \frac{F}{A}$$

p = pressure

F = force

A = area

.....newtons

(Total for Question 1 is 3 marks)



2 Solve the simultaneous equations

$$3x + 2y = 7$$

$$x = 2y - 3$$

.....
(Total for Question 2 is 3 marks)



1 0 3 3 1 1 1 2 8 0 0 0 4



3 Given that $x = 3$, find as a single fraction in its simplest form,

(a) $\frac{1}{2x} - \frac{2}{x}$

.....

(2)

(b) $\frac{5}{3} \div x$

.....

(2)

(Total for Question 3 is 4 marks)



4 There are 140 counters in a jar.

There are red, blue and yellow counters in the jar.

There are

twice as many red counters as there are blue counters in the jar

four times as many yellow counters as there are blue counters in the jar

Georgie takes $\frac{5}{8}$ of the red counters from the jar.

Katzia takes 11 of the blue counters from the jar.

Belal takes 40% of the yellow counters from the jar.

Work out the ratio of the number of red, blue and yellow counters now in the jar.

Give your ratio in its simplest form.

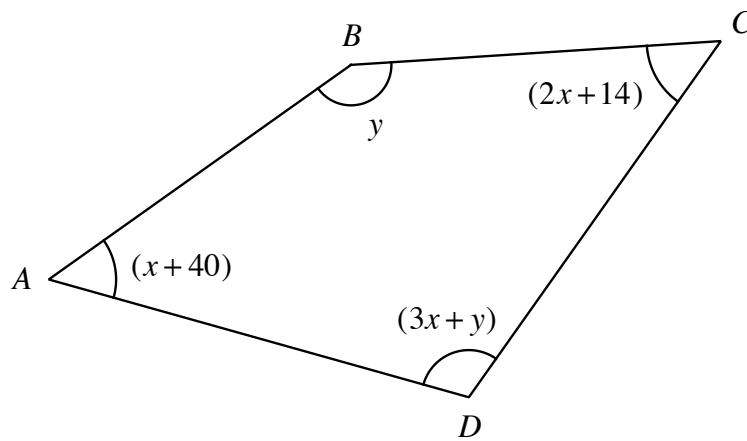
.....
(Total for Question 4 is 5 marks)



1 0 3 3 1 1 1 2 8 0 0 0 4



5 $ABCD$ is a kite.



**NOT
TO SCALE**

All angles given are in degrees.

Find the value of y .

$y = \dots\dots\dots$

(Total for Question 5 is 4 marks)



6 (a) Simplify a^0 .

.....

(1)

(b) Solve the equation $n^2 + 4(3 - n) = 17$.

.....

(4)

(Total for Question 6 is 5 marks)

7 Joshua creates a passcode using 4 digits from 0 to 9.

He cannot repeat digits in his passcode.

Henry attempts to guess, at random, Joshua's passcode.

Find the probability that Henry guesses Joshua's passcode correctly.

.....

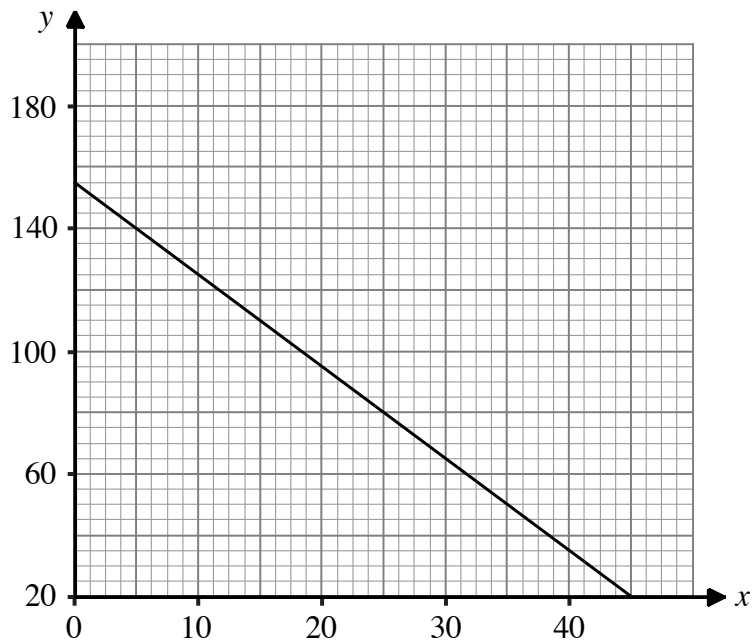
(Total for Question 7 is 3 marks)



1 0 3 3 1 1 1 2 8 0 0 0 4



8 A straight line is plotted on the coordinate grid below.



Chun attempts to work out the gradient of this line.

He uses the following calculation,

$$\begin{aligned} \text{gradient} &= \frac{\text{change in } y}{\text{change in } x} \\ &= -\frac{155}{45} \end{aligned}$$

His calculation is incorrect.

(a) Explain the error made by Chun in his calculation.

.....

.....

.....

(1)

(b) Calculate the correct gradient of the line.

.....

(1)

(Total for Question 8 is 2 marks)



- 9 The weight, in pounds, of 10 newborn babies is recorded by members at a hospital. The data they collected is shown in the table below.

5.4	4.6	7.5	6.6	8.9	9.4	7.0	8.2	5.7	7.0
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

- (a) Is this data discrete or continuous?

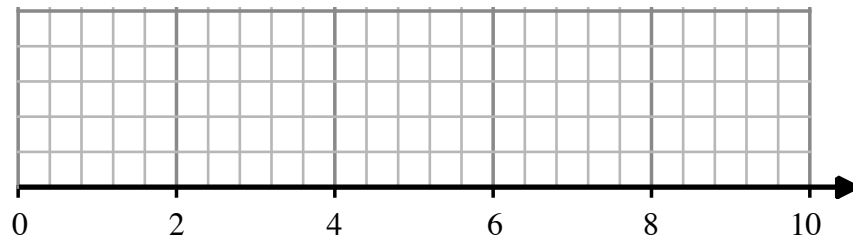
Circle your answer.

discrete

continuous

(1)

- (b) In the space below, draw a box-plot to represent these data.



(3)

(Total for Question 9 is 4 marks)



1 0 3 3 1 1 1 2 8 0 0 0 4



10 (a) Express $2^{32} \times 5^{25}$ in standard form.

.....

(2)

The minimum distance between Mars and Earth is approximately 54.6 million kilometres.

The maximum distance between Mars and Earth is approximately 402 million kilometres.

Light travels at a speed of 3×10^8 m/s.

The time taken, t seconds, for light to travel between Mars and Earth is between $a \leq t \leq b$.

(b) Use the data to approximate the value of $b - a$, giving your answer in standard form.

.....

(4)

(Total for Question 10 is 6 marks)



1 0 3 3 1 1 1 2 8 0 0 0 4

11 $f(x) = 4 - x^2$ $g(x) = 2x + 3$

(a) Find a simplified expression for $gf(x)$.

.....

(2)

Given that $h(x) = \frac{1}{3x-1}$,

(b) find $hgf(2)$.

.....

(3)

(Total for Question 11 is 5 marks)

12 Simplify $\sqrt{175} - \sqrt{63}$, giving your answer in the form $a\sqrt{7}$, where a is a constant to be found.

.....

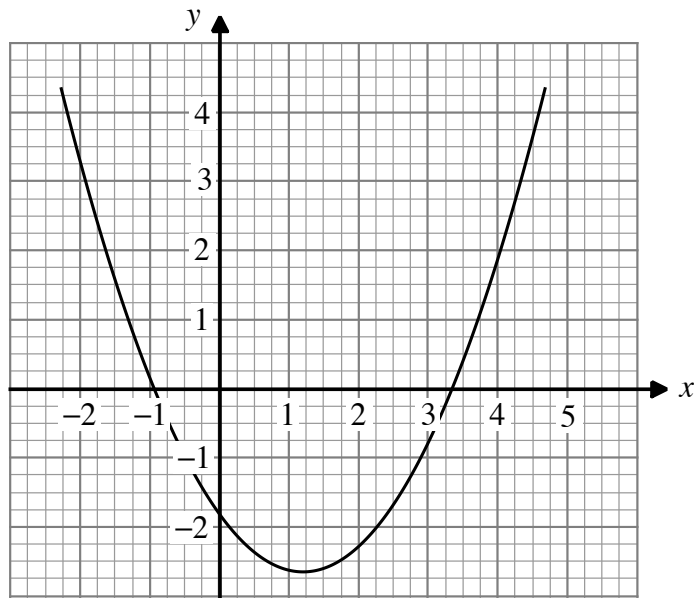
(Total for Question 12 is 4 marks)



1 0 3 3 1 1 1 2 8 0 0 0 4



13 The diagram below shows a sketch of the curve C with equation $y = f(x)$.



Given that $f(x) = ax^2 + bx + c$, use the graph to estimate

(a) the value of c ,

.....
(1)

(b) the coordinates of the turning point on C ,

.....
(1)

(c) the roots of $f(x)$.

.....
(1)

(d) Write down an estimate for the coordinates of the turning point of the curve $y = f(3x)$.

.....
(1)

(Total for Question 13 is 4 marks)



14 Bag **A** contains 7 red balls and 4 blue balls.

Bag **B** contains 5 red balls and 2 blue balls.

Leona picks, at random, one ball from Bag **A** and places it in bag **B**.

She then picks, at random, a ball from Bag **B**.

Find the probability that she picks a red ball from Bag **B**.

.....
(Total for Question 14 is 4 marks)



1 0 3 3 1 1 1 2 8 0 0 0 4



15 The first four terms of a quadratic sequence are

10 24 44 70

Find an expression for the n th term of this sequence.

.....
(Total for Question 15 is 3 marks)

16 The number x is of the form

$$x = n(n - 1)^2 - (n - 1)^3$$

where n is an integer greater than 1.

Prove algebraically that x is a square number.

(Total for Question 16 = 3 marks)



1 0 3 3 1 1 1 2 8 0 0 0 4

17 $A(4, 7)$, $B(-3, 10)$ and $C(2, 6)$.

The line segment AB intersects the y -axis at the point P .

The line perpendicular to AB , passing through C , intersects the y -axis at the point Q .

Show that the ratio $OP: PQ$ is 183: 155.

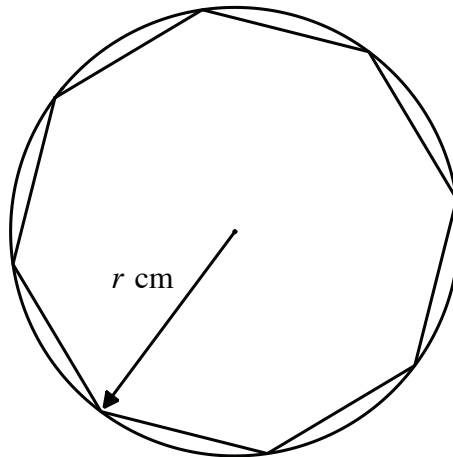
.....
(Total for Question 17 is 6 marks)



1 0 3 3 1 1 1 2 8 0 0 0 4



18 A regular octagon is inscribed inside of a circle of radius r cm, as shown in the diagram.



Prove that the area of the octagon is $2r^2\sqrt{2}$.

(Total for Question 18 = 4 marks)



19 The circle **C** has the equation $x^2 + y^2 = 4$.

(a) Write down the radius of the circle **C**.

.....

(1)

Circle **C** is translated by the vector $\begin{pmatrix} 2 \\ 0 \end{pmatrix}$ to give circle **B**.

The line **L** has the equation $x = 3$.

(b) On the same axes, draw a sketch of the circle **B** and the line **L**.

Label with coordinates

- the centre of circle **B**
- the coordinates of any intersection points circle **B** and line **L** have with the x -axis.

(4)

(c) Find the coordinates of intersection between the circle **B** and the line **L**.

.....

(3)

(Total for Question 19 is 8 marks)

TOTAL FOR PAPER = 80 MARKS

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1 0 3 3 1 1 1 2 8 0 0 0 4

