



GCSE
C300U10-1



MATHEMATICS –
COMPONENT 1
NON-CALCULATOR
MATHEMATICS
FOUNDATION TIER
TUESDAY, 21 MAY 2019
– MORNING
2 hours 15 minutes (plus
your additional time
allowance)

THE USE OF A
CALCULATOR IS NOT
PERMITTED IN THIS
EXAMINATION

For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1.	7	
2.	3	
3.	5	
4.	7	
5.	3	
6.	4	
7.	5	
8.	6	
9.	8	
10.	9	
11.	5	
12.	4	
13.	7	
14.	4	
15.	3	
16.	5	
17.	5	
18.	8	
19.	2	
20.	6	
21.	5	
22.	7	
23.	2	
Total	120	

Surname:	
Other Names:	
Centre Number:	
Candidate Number:	0

ADDITIONAL MATERIALS

A ruler, protractor and a pair of compasses may be required.

ITEMS INCLUDED WITH QUESTION PAPER

A separate Formula List.

A separate Diagram Booklet.

A spare Diagram Booklet.

Models for Question 2 (a) and Question 5.

(Turn over)

INSTRUCTIONS TO CANDIDATES

Use black ink, black ball – point pen, black felt tip or your usual method.

You may use a pencil for graphs and diagrams only.

Write your name, centre number and candidate number in the spaces on the front cover.

Answer ALL questions.

Write your answers in the spaces provided.

If you run out of space, use the continuation pages at the back of the booklet, taking care to number the question(s) correctly.

(Turn over)

INFORMATION FOR CANDIDATES

You should give details of your method of solution when appropriate.

Unless stated, diagrams are not drawn to scale.

Scale drawing solutions will not be acceptable where you are asked to calculate.

The number of marks is given in brackets at the end of each question or part – question.

You are reminded of the need for good English and orderly, clear presentation in your answers.

(Turn over)

5

1. (a) (i) Work out 0.5×100

[1 mark]

(ii) Work out $45 \div 10$

[1 mark]

continued on the next page . . .

(Turn over)

Question 1 continued

1. (b) Write 0.31 as

(i) a fraction,

[1 mark]

(ii) a percentage.

[1 mark]

continued on the next page . . .

(Turn over)

Question 1 continued

1. (c) Circle the greatest value.

4•07	4•18	4•601	4•0615	4•009
-------------	-------------	--------------	---------------	--------------

[1 mark]

(d) Work out $\frac{4}{5}$ of 45

[2 marks]

(Turn over)

2. (a) Ask for the model for Question 2 (a).
The model is NOT made to scale.

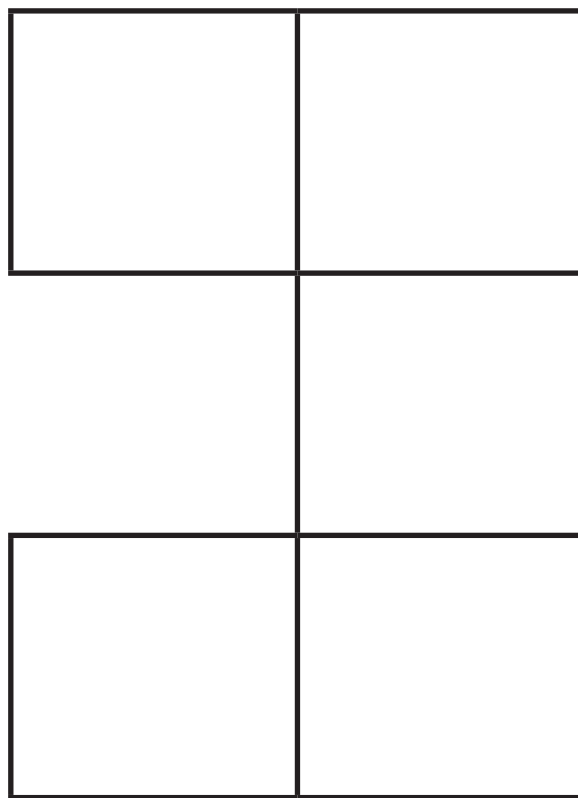
Halima makes a shape by joining
5 cubes.

She looks at each of the side
elevations, from the positions *A*, *B*,
C and *D*, and the plan, from *E*.

continued on the next page . . .

Question 2 (a) continued

2. (a) (i) Here is what Halima sees from one of her positions.



**Which position is this?
Circle your answer.**

<i>A</i>	<i>B</i>	<i>C</i>	<i>D</i>	<i>E</i>
-----------------	-----------------	-----------------	-----------------	-----------------

[1 mark]

(Turn over)

Question 2 (a) continued

- 2. (a) (ii) How many square faces can Halima see from position C?
Circle your answer.**

1	2	3	4	5
----------	----------	----------	----------	----------

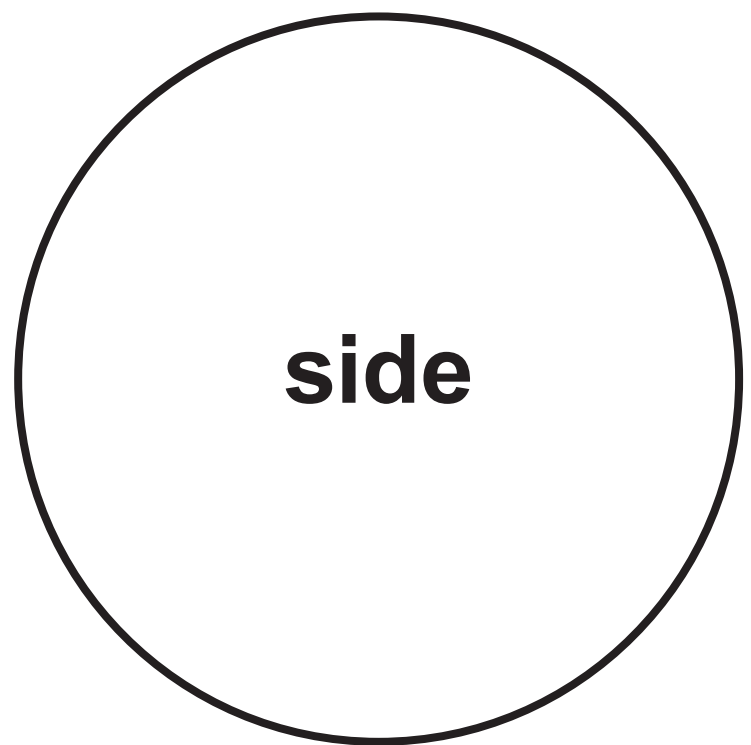
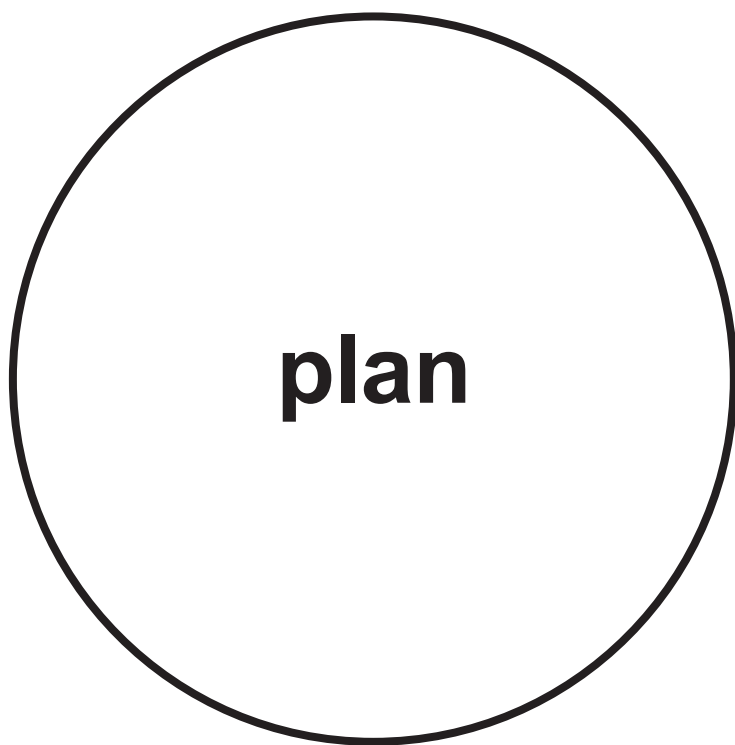
[1 mark]

continued on the next page . . .

(Turn over)

Question 2 continued

- 2. (b) The diagram below shows the plan and side elevation of another 3D shape.**



Circle the correct name for the 3D shape shown.

cylinder	circle	pyramid	cone	sphere
-----------------	---------------	----------------	-------------	---------------

[1 mark]

(Turn over)

3. **COVER INSURANCE** sells insurance for laptops.
They have two offers.

**Laptop insurance
OFFER 1**

**One payment only
£60 FOR ONE
WHOLE YEAR**

**Laptop insurance
OFFER 2**

**Pay monthly
12 MONTHS FOR
£4.50 PER MONTH**

continued on the next page . . .

(Turn over)

Question 3 continued

3. (a) Mika wants to buy insurance for his laptop.

Show that if Mika uses OFFER 2 he will save 10% of the cost of using OFFER 1.

[3 marks]

continued on the next page . . .

(Turn over)

Question 3 continued

3. (b) During April, COVER INSURANCE sold 630 policies.

How many policies per day, on average, did they sell for this month?

[2 marks]

(Turn over)

4. (a) (i) The table below shows the total number of medals won by four countries in the 2012 London Olympic Games.

Country	Number of medals
Brazil	17
Kenya	12
Jamaica	12
South Africa	6

On the grid provided for Question 4 (a) (i) in the separate Diagram Booklet, draw a bar chart to show this information.

[3 marks]

continued on the next page . . .

(Turn over)

Question 4 (a) continued

- 4. (a) (ii) Look at the diagram for Question 4 (a) (ii) in the separate Diagram Booklet.
The diagram is a pictogram.**

The pictogram shows the total number of medals won by the same four countries in the 2016 Rio Olympic Games.

Use the information given in the table and pictogram to complete the sentences opposite:

17

**The total number of medals won by
Brazil in 2016 is _____
more than they won in 2012.**

**The total number of medals won by
_____ in 2016 is 4 more
than they won in 2012.**

[2 marks]

continued on the next page . . .

(Turn over)

Question 4 continued

4. (b) In 2016, the total of gold, silver and bronze medals won by China was 70.

They won:

- **18 silver medals,**
- **the same number of gold medals as they did bronze medals.**

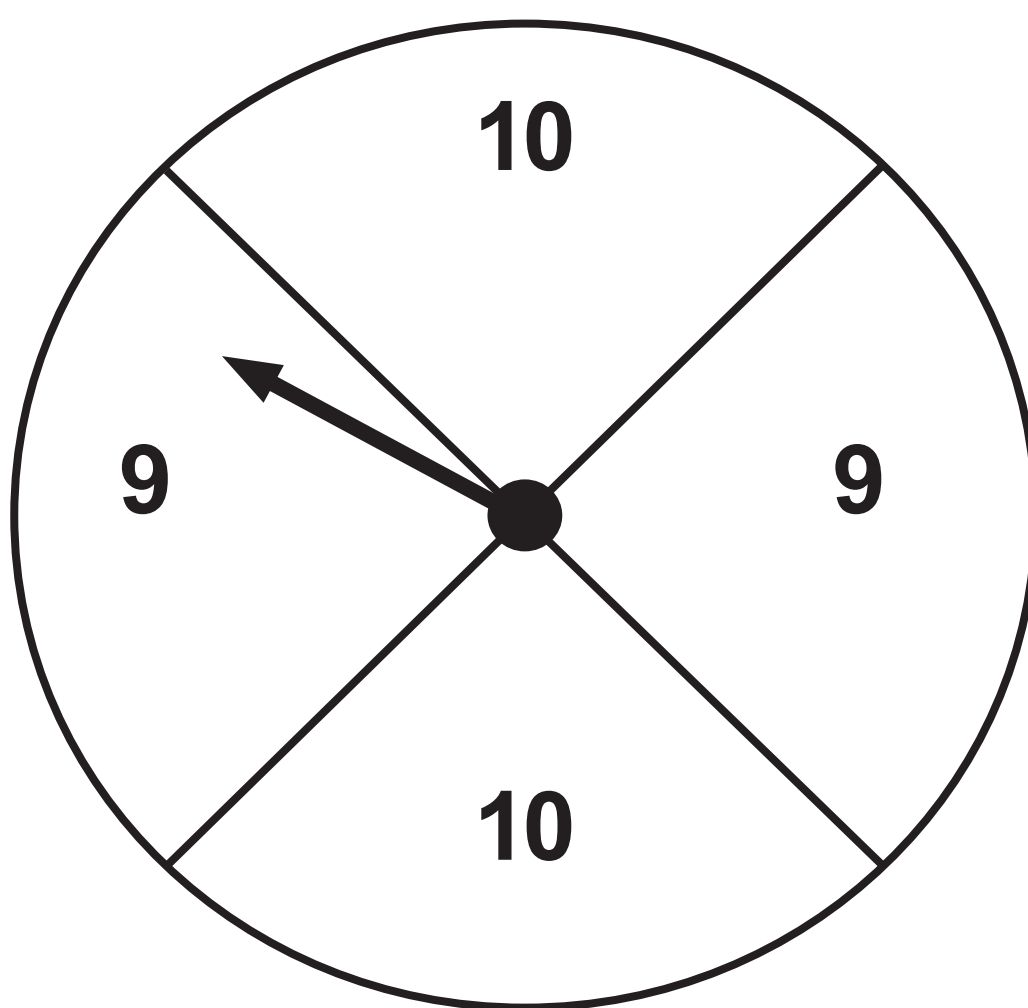
How many gold medals did China win?

_____ **gold medals**

[2 marks]

(Turn over)

- 5. Ask for the dice for Question 5.
It is a fair 8 – sided dice numbered
1 – 8
Look at the diagram below, it is a fair
spinner.**



continued on the next page . . .

(Turn over)

Question 5 continued

Jamie rolls the dice and spins the spinner.

He then multiplies the two scores.

- 5. (a) Look at the diagram for Question 5 (a) in the separate Diagram Booklet.**

Complete the diagram to show all Jamie's possible outcomes.

[1 mark]

continued on the next page . . .

Question 5 continued

5. (b) Find the probability that Jamie's outcome is an even number greater than 50

[2 marks]

(Turn over)

6. Look at the diagram for Question 6 in the separate Diagram Booklet. In the diagram, each square on the grid represents a one centimetre square. The diagram shows the line ***AB*** on a grid.

- (a) (i) Write down the coordinates of ***A***.

A (_____ , _____)
[1 mark]

- (ii) The point ***C*** is the mid – point of ***AB***.

Mark the position of the point ***C*** on the grid.

[1 mark]

continued on the next page . . .

(Turn over)

Question 6 continued

6. (b) The line ***BD*** is parallel to the ***y*** – axis.
Triangle ***ABD*** is a right – angled triangle.

Mark the position of point ***D*** on the grid and write down the length of ***AD***.

Remember: in the diagram, each square on the grid represents a one centimetre square.

Length ***AD*** = _____ cm

[2 marks]

(Turn over)

7. (a) Simplify

(i) $2f - g + 5f - 3g$

[2 marks]

(ii) $1 + 4 \times c \times c$

[1 mark]

continued on the next page . . .

(Turn over)

Question 7 continued

- 7. (b) (i) This formula converts a UK shoe size to a Japanese shoe size.**

$$\text{Japanese size} = \text{UK size} + 19$$

Yuto wears a Japanese size 29.5

What would Yuto's shoe size be in the UK?

[1 mark]

continued on the next page . . .

(Turn over)

Question 7 continued

- 7. (b) (ii) This table below shows the equivalent shoe sizes used in the UK and the USA.**

UK size	5	6	7	8	9
USA size	6	7	8	9	10

**Complete this formula
connecting the UK size and the
USA size.**

UK size = _____

[1 mark]

(Turn over)

8. Look at the table for Question 8 in the separate Diagram Booklet.

The table shows nutritional information about a bottle of the sports drink, FITADE.

- (a) Complete the table.

[3 marks]

continued on the next page . . .

(Turn over)

Question 8 continued

8. (b) One afternoon, Tori drinks 3 full bottles of FITADE.

How many millilitres of FITADE does Tori drink altogether, and how many grams of salt does this contain?

**She drinks _____ ml
containing _____ grams of
salt.**

[2 marks]

continued on the next page . . .

(Turn over)

Question 8 continued

8. (c) Show that sugars are 64% of the carbohydrate in FITADE.

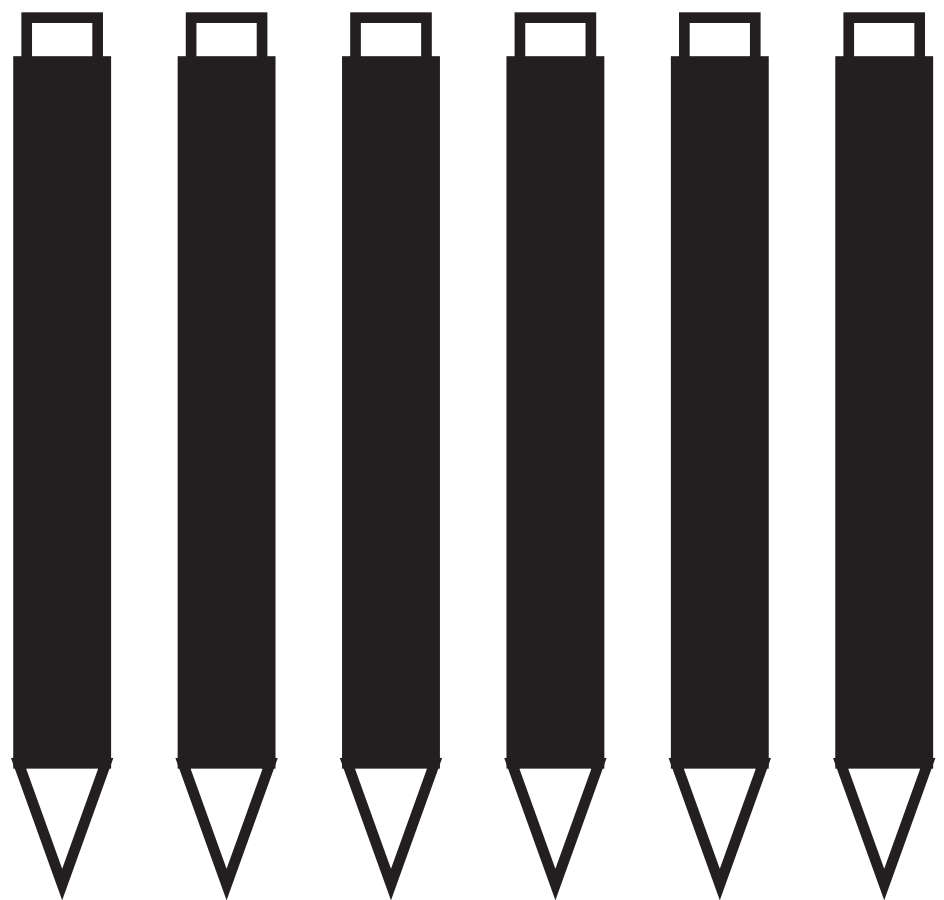
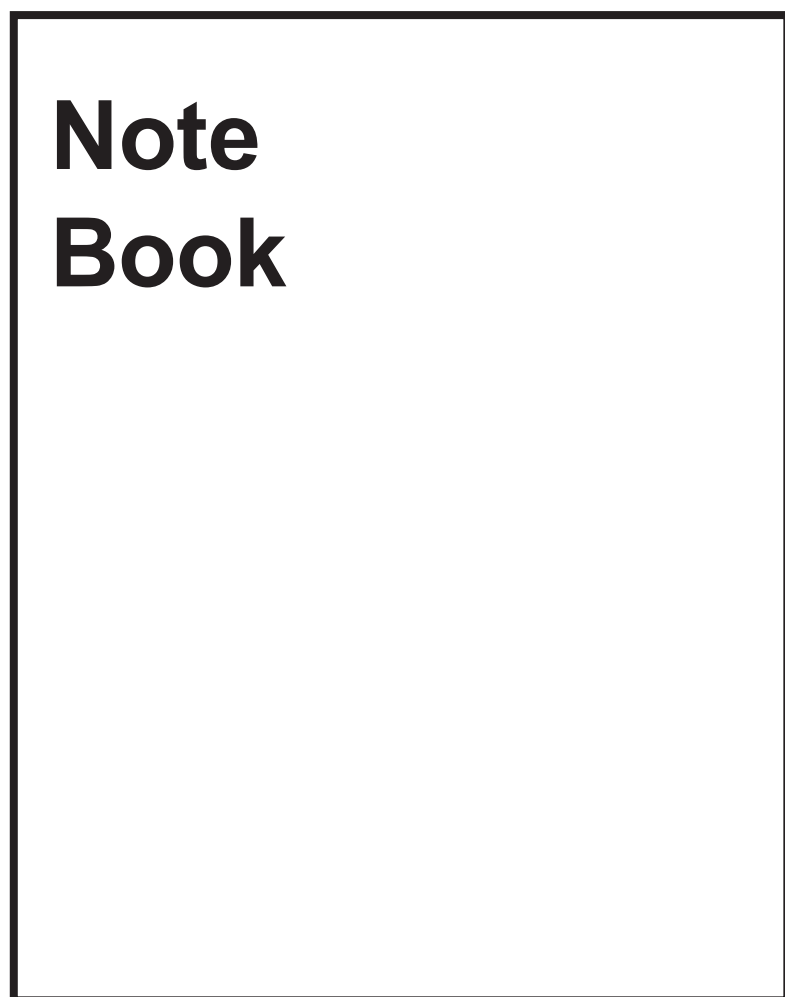
You must show all your working.

[1 mark]

(Turn over)

9. Petra is shopping with 2 of her friends.

(a) She buys a note book and six IDENTICAL pencils.



The note book costs the same as
2 of the pencils.
Her bill is £16.80

continued on the next page . . .

(Turn over)

Question 9 continued

9. (a) (i) How much does a note book cost?

[3 marks]

continued on the next page . . .

(Turn over)

Question 9 (a) continued

**9. (a) (ii) Petra pays with a £50 note.
She is given £34.20 change.**

She tells the shopkeeper,

**“You have given me too
much change.”**

Is Petra correct?

Yes ☐

No ☐

Show how you decide.

continued on the next page . . .

(Turn over)

[1 mark]

continued on the next page . . .

(Turn over)

Question 9 continued

- 9. (b) Look at the diagram for Question 9 (b) in the separate Diagram Booklet.**

**The 3 friends go to a café.
Part of the menu is shown.**

**Each of the 3 friends orders one
drink and one cake from this menu.**

**They save a total of exactly £5 using
the 3 for 2 offers.**

**Their bill totals £16.50 AFTER the
saving has been taken off.**

**What drinks and cakes did the 3
friends order?**

You must show all your working.

35

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

(Turn over)

Drinks:

_____ ,

_____ and

Cakes:

_____ ,

_____ and

[4 marks]

(Turn over)

10. Twelve members of a running club take part in three runs.

(a) The table below shows the times taken, in hours, by the 12 runners to complete the first run.

1•2	0•9	2•5	1•3	2•1	2•6
1•8	2•0	2•1	2•1	1•5	2•2

(i) Find the mode of the times.

[1 mark]

(Turn over)

Question 10 (a) continued

10.(a) (ii) Find the range of the times.

[1 mark]

continued on the next page . . .

(Turn over)

Question 10 (a) continued

10. (a)(iii) A runner was chosen at random from those who took part in the first run.

Find the probability that this runner took at most 1.5 hours.

[1 mark]

continued on the next page . . .

(Turn over)

Question 10 continued

10. (b) Look at the diagram for Question 10 (b) in the separate Diagram Booklet.

The diagram is a scatter diagram.

The scatter diagram shows the times it took 10 of the runners to complete the other two runs.

- (i) One of these 10 runners was injured during the third run and walked most of the way.**

On the diagram, CIRCLE the plot most likely to represent this runner on the scatter diagram.

[1 mark]

continued on the next page . . .

(Turn over)

Question 10 (b) continued

10. (b) (ii) The times, in hours, taken by the remaining 2 runners were:

	Runner 11	Runner 12
Second run	1•5	2•0
Third run	2•0	2•5

Plot these times on the scatter diagram.

[2 marks]

continued on the next page . . .

(Turn over)

Question 10 (b) continued

- 10. (b) (iii) Using the information on the completed scatter diagram, what was the difference between the fastest time for the second run and the fastest time for the third run?
Give your answer in minutes.**

**Time difference = _____ minutes
[3 marks]**

(Turn over)

11. (a) Look at the diagram for Question 11 (a) in the separate Diagram Booklet.
The diagram is NOT drawn to scale.
The diagram shows triangle *ABC*.

In the diagram,

$$AB = 15 \text{ cm}$$

$$AC = 41 \text{ cm}$$

$$BC = 52 \text{ cm}$$

Work out the area of triangle *ABC*.

Area *ABC* = _____ cm^2

[2 marks]

continued on the next page . . .

(Turn over)

Question 11 continued

11.(b) Look at the diagram for Question 11 (b) in the separate Diagram Booklet.

**The diagram is NOT drawn to scale.
The diagram shows a shape.
The shape is made from two rectangles.**

**The shape has one line of symmetry.
The perimeter of the shape is 40 cm.
The length of *BC* is 4 times the length of *AB*.**

Work out the length of *BC*.

(Turn over)

45

BC = _____ cm

[3 marks]

(Turn over)

- 12. Look at the diagram for Question 12 in the separate Diagram Booklet. The diagram IS drawn to scale. The diagram shows the position of two points, *A* and *B*. The scale is 1 cm represents 1 km.**

(a) Measure and write down the bearing of *B* from *A*.

[1 mark]

continued on the next page . . .

(Turn over)

Question 12 continued

12. (b) Point C is 5 km from A and 6 km from B .

The bearing of C from B is an acute angle.

Complete the diagram to find the position of point C .

[3 marks]

(Turn over)

13. Steph is a baker.

(a) She bakes 42 white rolls and 60 brown rolls.

Write the ratio of white rolls to brown rolls in its simplest form.

white rolls : brown rolls =

_____ : _____

[2 marks]

continued on the next page . . .

(Turn over)

Question 13 continued

13. (b) Steph makes scones in three flavours: cheese, fruit and plain.

She makes:

- **4 times as many fruit scones as cheese scones,**
- **3 times as many plain scones as cheese scones.**

She sells each scone for the same price.

She makes a total of £96 from the sale of all the scones.

How much does she make from the sale of the plain scones?

50

[3 marks]

continued on the next page . . .

(Turn over)

Question 13 continued

13.(c) Steph makes and sells birthday cakes.

Each cake costs £54 to make.

She makes a profit of 15% on each cake.

What is the selling price of Steph's birthday cakes?

Selling price = £ _____

[2 marks]

(Turn over)

14. Look at the diagram for Question 14 in the separate Diagram Booklet. The diagram is NOT drawn to scale. The diagram shows points *P*, *Q*, *R*, *S*, *T* and *U*.

In the triangle *RTS*,
RT = *TS* and angle *RTS* = 100°
Angle *UTQ* is a right angle.
QT is parallel to *RS*.
Angle *PTU* is labelled *x*.

Show that $x = 50^\circ$.
Give a reason for each step of your answer.

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

[4 marks]
(Turn over)

15. Terry is doing his homework.

(a) He is trying to find the value of x when

$$x : 2 = 30 : 12$$

He writes:


$$x : 2 = 30 : 12$$

The rule is -18

$$\text{so } x = 20$$

continued on the next page . . .

(Turn over)

Question 15 (a) continued

15. (a) Explain why Terry is wrong.

[1 mark]

continued on the next page . . .

(Turn over)

Question 15 continued

15. (b) Terry's next question is:

A factory production line makes 275 thousand cans of drink in 5 hours. How many hours would it take for this production line to make 165 thousand cans of the same drink? You may assume each can is the same size.

Terry thinks the answer is 3 hours.

Is Terry correct?

Yes

☐

No

☐

(Turn over)

57

Show how you decide.

[2 marks]

(Turn over)

16. (a) Calculate $\frac{3}{7} + \frac{7}{9}$

Give your answer as a mixed number.

[3 marks]

continued on the next page . . .

(Turn over)

Question 16 continued

16. (b) When a fraction is divided by $\frac{1}{3}$ the answer is $\frac{6}{7}$

Find this fraction.

[illegible]

[2 marks]
(Turn over)

17. Huw is paid a weekly wage.

Every week he:

- **saves $\frac{1}{5}$ of his wage,**
- **spends 70% of the money HE HAS LEFT on his living expenses,**
- **spends all that remains on his social life.**

(a) One week, Huw saves £40

How much does Huw spend on his social life?

(Turn over)

[3 marks]

17. (b) What percentage of his weekly wage does Huw spend on his social life?

[2 marks]

(Turn over)

18. (a) Solve $19 - 4x = 11$

[2 marks]

continued on the next page . . .

(Turn over)

Question 18 continued

18. (b) Solve $\frac{2x - 3}{4} = 3x$

[3 marks]

continued on the next page . . .

(Turn over)

Question 18 continued

18. (c) (i) Solve $3x + 2 > 5$

[2 marks]

continued on the next page . . .

(Turn over)

Question 18 (c) continued

- 18. (c) (ii) On the diagram provided for Question 18 (c) (ii) in the separate Diagram Booklet, represent your answer to part (c) (i) on the number line on the number line shown.**

[1 mark]

(Turn over)

- 19. Look at the diagram for Question 19 (a) in the separate Diagram Booklet. The diagram shows a table and a pie chart.**

Cherie is in charge of marketing for a tourist attraction.

- (a) One weekend, she collects some data about the value of ice cream sales from the café. She records her data in a table and uses it to draw a pie chart.**

State one criticism of the use of a pie chart to display her data.

[1 mark]

continued on the next page . . .

(Turn over)

Question 19 continued

19.(b) Look at the diagram for Question 19 (b) in the separate Diagram Booklet.

Cherie also records the number of visitors to the tourist attraction each season for 4 years.

Her results are shown in the table.

Comment on the trend in the ANNUAL number of visitors shown by the data in the table.

[1 mark]

(Turn over)

68

20. (a) $120 = 2^3 \times 3^k \times 5$

Find the value of k .

[1 mark]

continued on the next page . . .

(Turn over)

Question 20 continued

20. (b) Write 168 as a product of its prime factors.

[2 marks]

continued on the next page . . .

(Turn over)

Question 20 continued

20. (c) LOWATTS Ltd makes light bulbs that are identical in size.

They have regular orders from COMPANY A for 120 light bulbs and from COMPANY B for 168 light bulbs.

LOWATTS Ltd uses one size of box to supply both COMPANY A and COMPANY B.

Each box used contains the same number of light bulbs and is full. The number of boxes used is as few as possible.

How many light bulbs does each box hold?

71

[3 marks]

(Turn over)

21. When Jenna was measured recently she was 127 cm tall, CORRECT TO THE NEAREST CENTIMETRE.

For safety reasons, the minimum height for a person to ride the Big Coaster at a funfair in the USA is 50 inches.

You are given:

$$20 \text{ inches} = 50.8 \text{ cm.}$$

You must be
this tall to ride



continued on the next page . . .

(Turn over)

Question 21 continued

21. (a) Using the information given, decide whether it might possibly be safe, it is definitely safe, or it is definitely not safe for Jenna to ride the Big Coaster.

Might possibly be safe

☐

Definitely safe

☐

Definitely not safe

☐

Show how you decide.

(Turn over)

This image shows a blank sheet of white paper with horizontal ruling lines. The lines are evenly spaced and run across the width of the page. There are no margins, text, or other markings on the paper.

continued on the next page . . .

continued on the next page . . .

Question 21 continued

21. (b) (i) State an assumption that you have made in your answer to part (a).

[1 mark]

continued on the next page . . .

(Turn over)

Question 21 (b) continued

21. (b)(ii) Comment on the effect that your assumption has had on your decision.

[1 mark]

(Turn over)

22. The table shows some of the values of $y = x^2 + x - 1$ for $-2 \leq x \leq 1$

x	$y = x^2 + x - 1$
-2	
-1	-1
-0.5	-1.25
0	
1	

(a) Complete the table above.

[1 mark]

continued on the next page . . .

(Turn over)

Question 22 continued

22. (b) On the graph paper provided for Question 22 (b) in the separate Diagram Booklet, draw the graph of

$$y = x^2 + x - 1 \text{ for } -2 \leq x \leq 1$$

[2 marks]

(c) State the equation of the line of symmetry of the curve

$$y = x^2 + x - 1$$

[1 mark]

continued on the next page . . .

(Turn over)

Question 22 continued**22. (d) Use your graph to solve**

$$x^2 + x - 1 = 0$$

[2 marks]**(Turn over)**

23. $\mathbf{p} = \begin{pmatrix} 4 \\ 2 \end{pmatrix}$ and $\mathbf{q} = \begin{pmatrix} -3 \\ 2 \end{pmatrix}$

Work out the column vector $\frac{1}{2} \mathbf{p} - \mathbf{q}$

$$\frac{1}{2} \mathbf{p} - \mathbf{q} = \begin{pmatrix} \\ \end{pmatrix}$$

[2 marks]

END OF PAPER

TOTAL 120 MARKS

(Turn over)

[illegible]

(Turn over)

[illegible]