**GCSE**

wjec cbac

C300U10-1

A23-C300U10-1

eduqas
Part of WJEC

**MATHEMATICS – Component 1**
**Non-Calculator Mathematics**

**FOUNDATION TIER**

2 hours 15 minutes

| For Examiner's use only | | |
|---|---|---|
| Question | Maximum Mark | Mark Awarded |
| 1. | 9 | |
| 2. | 5 | |
| 3. | 2 | |
| 4. | 4 | |
| 5. | 4 | |
| 6. | 5 | |
| 7. | 6 | |
| 8. | 3 | |
| 9. | 5 | |
| 10. | 2 | |
| 11. | 6 | |
| 12. | 3 | |
| 13. | 2 | |
| 14. | 4 | |
| 15. | 2 | |
| 16. | 5 | |
| 17. | 5 | |
| 18. | 5 | |
| 19. | 2 | |
| 20. | 2 | |
| 21. | 4 | |
| 22. | 2 | |
| 23. | 4 | |
| 24. | 3 | |
| 25. | 3 | |
| 26. | 5 | |
| 27. | 1 | |
| 28. | 3 | |
| 29. | 2 | |
| 30. | 6 | |
| 31. | 3 | |
| 32. | 3 | |
| Total | 120 | |

**ADDITIONAL MATERIALS**

An additional formulae sheet.

The use of a calculator is not permitted in this examination.

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

**INSTRUCTIONS TO CANDIDATES**

Use black ink or black ball-point pen.

Do not use gel pen or correction fluid.

You may use a pencil for graphs and diagrams only.

Write your name, centre number and candidate number in the spaces at the top of this page.

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

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

**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.

NOV23C300U10101

## Formula list

Area and volume formulae

Where $r$ is the radius of the sphere or cone, $l$ is the slant height of a cone and $h$ is the perpendicular height of a cone:

$$\text{Curved surface area of a cone} = \pi r l$$

$$\text{Surface area of a sphere} = 4\pi r^2$$

$$\text{Volume of a sphere} = \frac{4}{3}\pi r^3$$

$$\text{Volume of a cone} = \frac{1}{3}\pi r^2 h$$

Kinematics formulae

Where $a$ is constant acceleration, $u$ is initial velocity, $v$ is final velocity, $s$ is displacement from the position when $t = 0$ and $t$ is time taken:

$$v = u + at$$

$$s = ut + \frac{1}{2}at^2$$

$$v^2 = u^2 + 2as$$

(C300U10-1)

**1.** (a) Work out the following.

(i) $20 \times 40$ [1]

...................................................................................................

...................................................................................................

...................................................................................................

(ii) $57 \div 3$ [1]

...................................................................................................

...................................................................................................

...................................................................................................

(iii) $\frac{2}{5}$ of 30 [2]

...................................................................................................

...................................................................................................

...................................................................................................

(iv) 30% of 70 [2]

...................................................................................................

...................................................................................................

...................................................................................................

(v) $1\cdot03 + 12\cdot8$ [1]

...................................................................................................

...................................................................................................

...................................................................................................

(b) Write 8% as a decimal. [1]

...................................................................................................

(c) In the box, write the **smallest** possible whole number to make the statement correct. [1]

$4\cdot4$ $<$ .............................

**Turn over.**

**2.** (a) Most numbers have an **even** number of factors.

For example,
10 has **four** factors: 1, 2, 5 and 10.
11 has **two** factors: 1 and 11.

There is one number between 13 and 19 that has an **odd** number of factors.
Find this number.
Write down all the factors of this number. [2]

.................................................................................................................................................................

.................................................................................................................................................................

.................................................................................................................................................................

.................................................................................................................................................................

.................................................................................................................................................................

.................................................................................................................................................................

.................................................................................................................................................................

.................................................................................................................................................................

.................................................................................................................................................................

.................................................................................................................................................................

The number is ...............................

The factors of this number are ....................................................................................

(b) Write down the first three **even** multiples of 7. [1]

.................................................................................................................................................................

........................................ , ........................................ , ........................................

(C300U10-1)

(c)  Linda says,

> When I round the number of pupils in my class to the nearest 5, the answer is 25.

How many pupils could there be in her class?
Write all the possible answers.  [2]

..................................................................................................................................................

..................................................................................................................................................

**3.**  What percentage of the following shape is shaded?  [2]



..................................................................................................................................................

..................................................................................................................................................

**Turn over.**
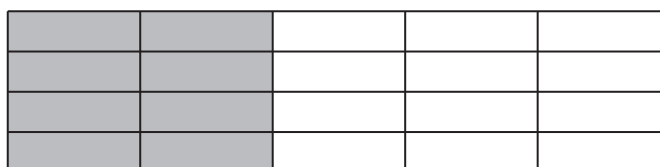
**4.** A teacher asked a group of students to choose their favourite sandwich filling.
The five options were: cheese, chicken, ham, salad or tuna.
Each student chose **one** option.
The table and the pictogram each show some of the results for the five fillings.

| Filling | Number of students |
|---------|--------------------|
| Cheese | 3 |
| Chicken | |
| Ham | |
| Salad | 1 |
| Tuna | 6 |



**Key:** ⬤ represents ................................ students

(a) Complete the key, the table and the pictogram. [3]

.......................................................................................................................................................

.......................................................................................................................................................

(b) What is the modal choice of sandwich filling? [1]

.......................................................................................................................................................

(C300U10-1)

**5.** (a) Lucy writes down the first five **square** numbers.
Lucy chooses two square numbers that have a difference of 12.

Which square numbers did Lucy choose? [2]

.......................................................................................................................................................

.......................................................................................................................................................

.......................................................................................................................................................

.......................................................................................................................................................

.......................................................................................................................................................

The two square numbers are ............................ and ...........................

(b) Mary adds two **odd** numbers together and gets an answer of 21.

Could Mary's answer be correct?

☐ Yes    ☐ No    ☐ Cannot tell

Give a reason for your answer. [1]

.......................................................................................................................................................

.......................................................................................................................................................

.......................................................................................................................................................

(c) Write the following values in ascending order. [1]

3          0·3          0·302          0·35          0·8

.......................................................................................................................................................

.............................    .............................    .............................    .............................    .............................

Smallest value                                                              Greatest value

© WJEC CBAC Ltd.          (C300U10-1)          **Turn over.**

**6.** **(a)** Twenty-five players in a rugby team voted for their player of the season.

(i) The three nominations for player of the season were Ashton, Jamal and Oliver.

The frequency table shows the tally of the votes from 10 of the players.

| Candidate | Tally | Frequency |
|---|---|---|
| Ashton |卌 | |
| Jamal | IIII | |
| Oliver | I | |

The remaining 15 votes are shown below.

| | | | |
|---|---|---|---|
| Ashton | Oliver | Jamal | Oliver |
| Oliver | Jamal | Oliver | Jamal |
| Jamal | Oliver | Ashton | Jamal |
| Oliver | Oliver | Jamal | |

Which player won the vote for player of the season?
You must show all your working. [2]

.............................................................................................................................................................

.............................................................................................................................................................

.............................................................................................................................................................

The player of the season is ...................................................................

(ii) What percentage of the 25 students voted for Oliver? [2]

.............................................................................................................................................................

.............................................................................................................................................................

.............................................................................................................................................................

© WJEC CBAC Ltd. (C300U10-1)

(b)  Some of the players in Lindsey's team have missed games because of injury.
She writes a question to find out how many games they have missed.
Here is the question:

How many games have you missed this season due to injury?

☐  0–2            ☐  2–4            ☐  5 or more

State **one** criticism of her question.                                    [1]

...................................................................................................................................................................

...................................................................................................................................................................

© WJEC CBAC Ltd.          (C300U10-1)                              **Turn over.**

C300U101
09

**7.** (a) Robin has a scale drawing of his local park.
The scale on the drawing is 1 cm represents 250 cm.
On the drawing a flowerbed is 6 cm long.

What is the actual length of the flowerbed?
Write your answer in **metres**. [3]

.......................................................................................................................................................

.......................................................................................................................................................

.......................................................................................................................................................

.......................................................................................................................................................

The actual length of the flowerbed is .................................... m

(b) Robin has 240 daffodils and 60 tulips.

What fraction of these flowers are daffodils?
Give your answer in its simplest form. [2]

.......................................................................................................................................................

.......................................................................................................................................................

.......................................................................................................................................................

(c) Some rose bushes are divided equally between 2 gardeners.

Write this division as a ratio. [1]

.......................................................................................................................................................

.......................................................................................................................................................

........................................ : ........................................

(C300U10-1)

**8.** A shop sells the same brand of lemonade in two different-sized bottles.

1000 ml for £2.50                         300 ml for 81p

Which bottle is the better value for money?

[ ]   The 1000 ml bottle          [ ]   The 300 ml bottle

You must show all your working.                                    [3]

..............................................................................................................................................................
..............................................................................................................................................................
..............................................................................................................................................................
..............................................................................................................................................................
..............................................................................................................................................................
..............................................................................................................................................................
..............................................................................................................................................................
..............................................................................................................................................................
..............................................................................................................................................................
..............................................................................................................................................................
..............................................................................................................................................................

(C300U10-1)                              **Turn over.**

**9.** (a) Solve $6x = 42$. [1]

.................................................................................................................................................

.................................................................................................................................................

(b) Calculate the value of $4y$ when $y = -12$. [1]

.................................................................................................................................................

.................................................................................................................................................

(c) Simplify $5w + 3(6w - 2)$. [2]

.................................................................................................................................................

.................................................................................................................................................

(d) A shirt has $t$ buttons.
Write down, in terms of $t$, the number of buttons on 8 shirts. [1]

.................................................................................................................................................

.................................................................................................................................................

© WJEC CBAC Ltd. (C300U10-1)

**10.** Here is a number machine.

| INPUT | → | SUBTRACT 3 | → | MULTIPLY BY 5 | → | OUTPUT |
|-------|---|------------|---|---------------|---|--------|
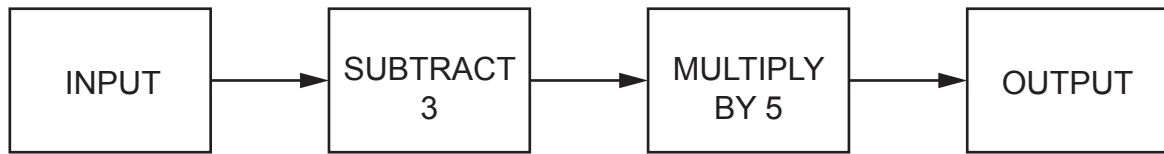
(a) The input is 10.
What is the output? [1]

..............................................................................................................................................

..............................................................................................................................................

..............................................................................................................................................

(b) The output is 55.
What is the input? [1]

..............................................................................................................................................

..............................................................................................................................................

..............................................................................................................................................

(C300U10-1)

**Turn over.**

**11.** Adele and Lewis are shopping in a bakery.

(a)

> ## Bread rolls
>
> 98p each
> OR
> £4.50 for a bag of 5 rolls

Adele buys a bag of 5 rolls.

How much money does she save compared to buying 5 rolls separately? [3]

.........................................................................................................................................................

.........................................................................................................................................................

.........................................................................................................................................................

.........................................................................................................................................................

.........................................................................................................................................................

(b) Croissants cost 90p each and cinnamon whirls cost £1.25 each.
Lewis buys 4 croissants and some cinnamon whirls.
Lewis has £10.

What is the greatest number of cinnamon whirls that Lewis can buy?
You must show all your working. [3]

.........................................................................................................................................................

.........................................................................................................................................................

.........................................................................................................................................................

.........................................................................................................................................................

.........................................................................................................................................................

.........................................................................................................................................................

.........................................................................................................................................................

.........................................................................................................................................................

© WJEC CBAC Ltd. (C300U10-1)

**12.** A wind turbine generates 390 units of electricity per hour.

How many units of electricity will this turbine generate if it continues at this rate for 2 hours and 20 minutes? [3]

......................................................................................................................................................

......................................................................................................................................................

......................................................................................................................................................

......................................................................................................................................................

Units of electricity generated = ......................................................................

**13.** (a) Ben needs 90 bottles of water for an athletics event.
The bottles of water are sold in packs of 8.

He makes this calculation to find out the number of packs he needs:

**90 ÷ 8 = 11·25**

He decides to buy 11 packs of water.

Is Ben's decision correct?
You must give a reason for your answer. [1]

☐ Yes     ☐ No

......................................................................................................................................................

......................................................................................................................................................

(b) Ben divides the 90 bottles in the ratio 4:1.

He says,

**"To work out the larger share, we should divide 90 by 4".**

Explain what is wrong with Ben's method. [1]

......................................................................................................................................................

......................................................................................................................................................

......................................................................................................................................................

© WJEC CBAC Ltd.     (C300U10-1)     **Turn over.**

C300U101
15

**14.** The table shows some of the values of $y = 1 - 2x$ for $-2 \leqslant x \leqslant 2$.

| $x$ | $-2$ | $-1$ | $0$ | $1$ | $2$ |
|---|---|---|---|---|---|
| $y = 1 - 2x$ | 5 | | 1 | | |

(a)   Complete the table. [2]

......................................................................................................................................................

......................................................................................................................................................

......................................................................................................................................................

......................................................................................................................................................

(b)   On the grid, draw the line $y = 1 - 2x$ for $-2 \leqslant x \leqslant 2$. [2]

......................................................................................................................................................

......................................................................................................................................................

(C300U10-1)

© WJEC CBAC Ltd. (C300U10-1) **Turn over.**
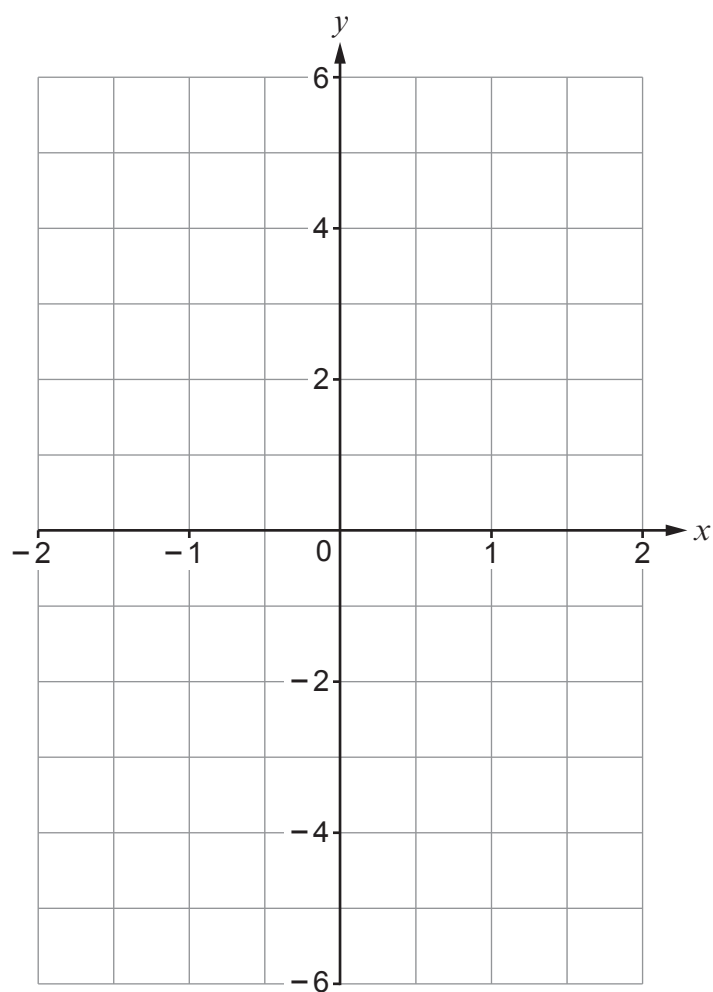
**15.** A bag contains 100 identically-sized coloured balls.

A ball is selected at random.
The table shows the probability of choosing a blue ball, a red ball or a green ball.

| Colour | Blue | Red | Green |
|---|---|---|---|
| Probability | 0·42 | 0·3 | 0·18 |

Show that the bag must contain 10 balls that are **not** blue, red or green. [2]

...................................................................................................................................................

...................................................................................................................................................

...................................................................................................................................................

**16.** Gary owns a garage selling second-hand cars. On Saturday, he had 72 petrol cars and 48 diesel cars for sale.

(a) Write the number of petrol cars to the number of diesel cars as a ratio in its simplest form. [2]

...................................................................................................................................................

...................................................................................................................................................

(b) What percentage of cars are diesel? [3]

...................................................................................................................................................

...................................................................................................................................................

...................................................................................................................................................

Examiner only

**17.** (a) Calculate 12% of £750. [2]

..................................................................................................................................................

..................................................................................................................................................

..................................................................................................................................................

..................................................................................................................................................

..................................................................................................................................................

..................................................................................................................................................

(b) When a fraction is added to $\frac{2}{5}$ the answer is $\frac{7}{15}$.

Find the fraction that is added. [3]

..................................................................................................................................................

..................................................................................................................................................

..................................................................................................................................................

..................................................................................................................................................

..................................................................................................................................................

(C300U10-1)

**Turn over.**

**18.** Sarah has a water container in the shape of a cuboid.
The area of the base of the container is $150\,cm^2$.
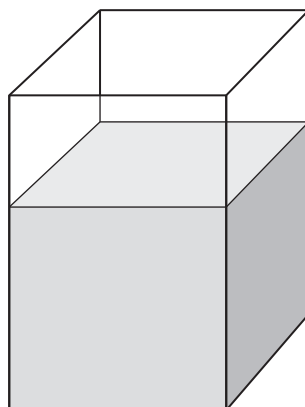


*Diagram not drawn to scale*

Water is leaking from the container at a constant rate.

At 10:00 the water is $20\,cm$ high.
At 10:15 the water is $17\,cm$ high.

How much water is in the container at 11:00?
Give your answer in litres. [5]

...........................................................................................................................................................................

...........................................................................................................................................................................

...........................................................................................................................................................................

...........................................................................................................................................................................

...........................................................................................................................................................................

...........................................................................................................................................................................

...........................................................................................................................................................................

...........................................................................................................................................................................

There are ......................................................... litres of water in the container at 11:00.

© WJEC CBAC Ltd.          (C300U10-1)

Examiner only

**19.** 120 people each completed a puzzle.
The times taken to complete the puzzle are shown in the diagram below.
The diagram uses groups of width 5 minutes: $0 \leqslant$ time $< 5$, $5 \leqslant$ time $< 10$, and so on.

Frequency



Time taken, $t$ (minutes)
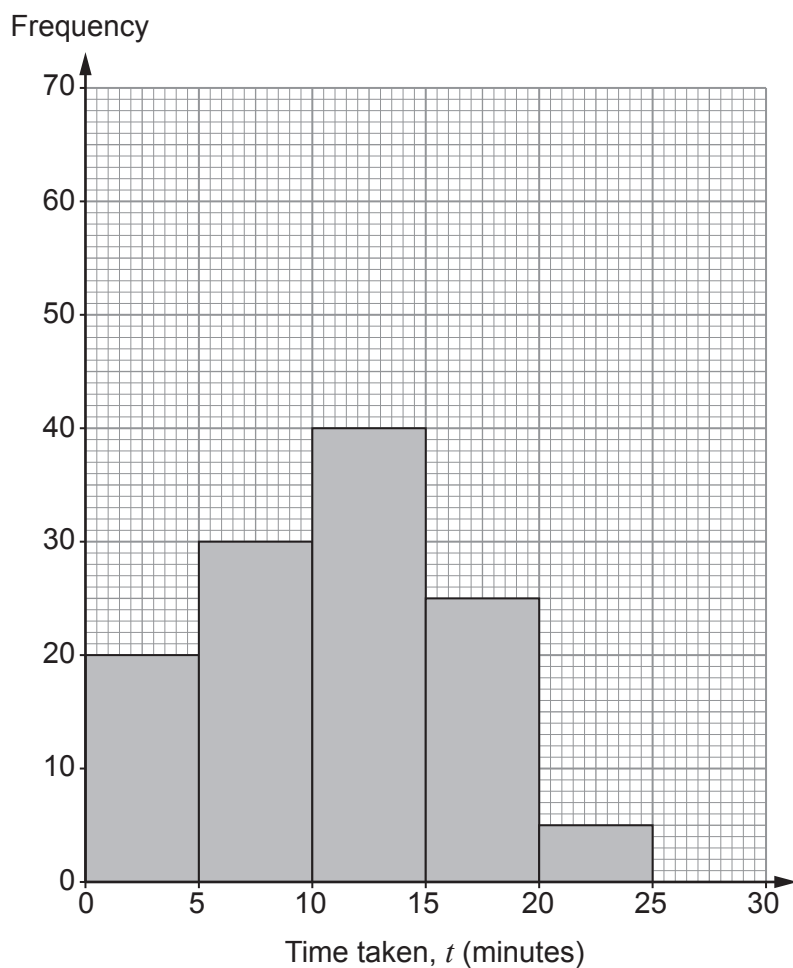
A person is chosen at random.

What is the probability that this person took less than 15 minutes to complete the puzzle?     [2]

....................................................................................................................................................................

....................................................................................................................................................................

....................................................................................................................................................................

....................................................................................................................................................................

© WJEC CBAC Ltd.          (C300U10-1)                                    **Turn over.**

**20.** The diagram below shows three straight lines, *AB*, *CD* and *GH*.
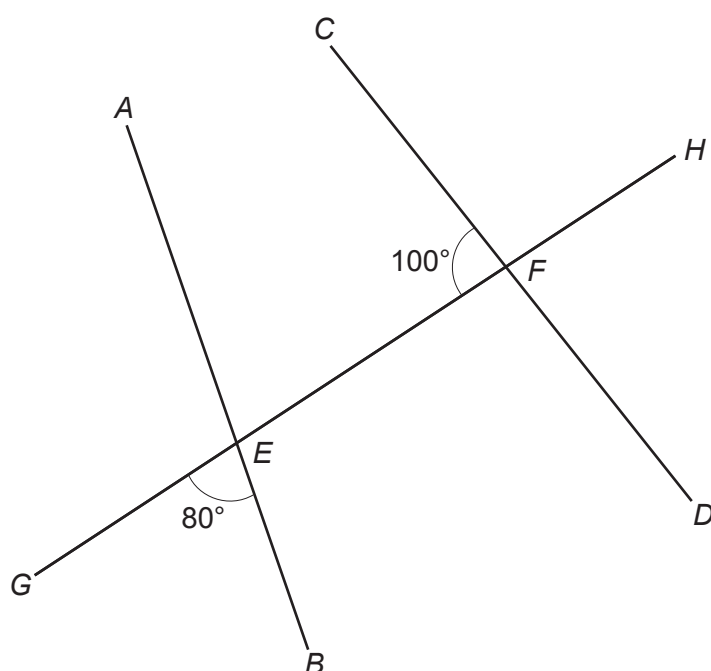


*Diagram not drawn to scale*

Show that *AB* and *CD* are parallel.
You must give reasons to justify your answer. [2]

..................................................................................................................................................

..................................................................................................................................................

..................................................................................................................................................

..................................................................................................................................................

..................................................................................................................................................

..................................................................................................................................................

..................................................................................................................................................

..................................................................................................................................................

(C300U10-1)

**BLANK PAGE**

**PLEASE DO NOT WRITE
ON THIS PAGE**

(C300U10-1) **Turn over.**

**21.** David and Asif are studying the size of leaves.

Before measuring the leaves, they agreed on the following conditions:
- The length of the leaf does not include the stem.
- The width of the leaf is measured at the widest part of the leaf.

(a) Why do they need to agree on these conditions to measure the leaves? [1]

.............................................................................................................................................

.............................................................................................................................................

(b) David and Asif have each drawn a scatter diagram to show their results.

David's scatter diagram

Length (cm) vs Width (cm)

© WJEC CBAC Ltd. (C300U10-1)
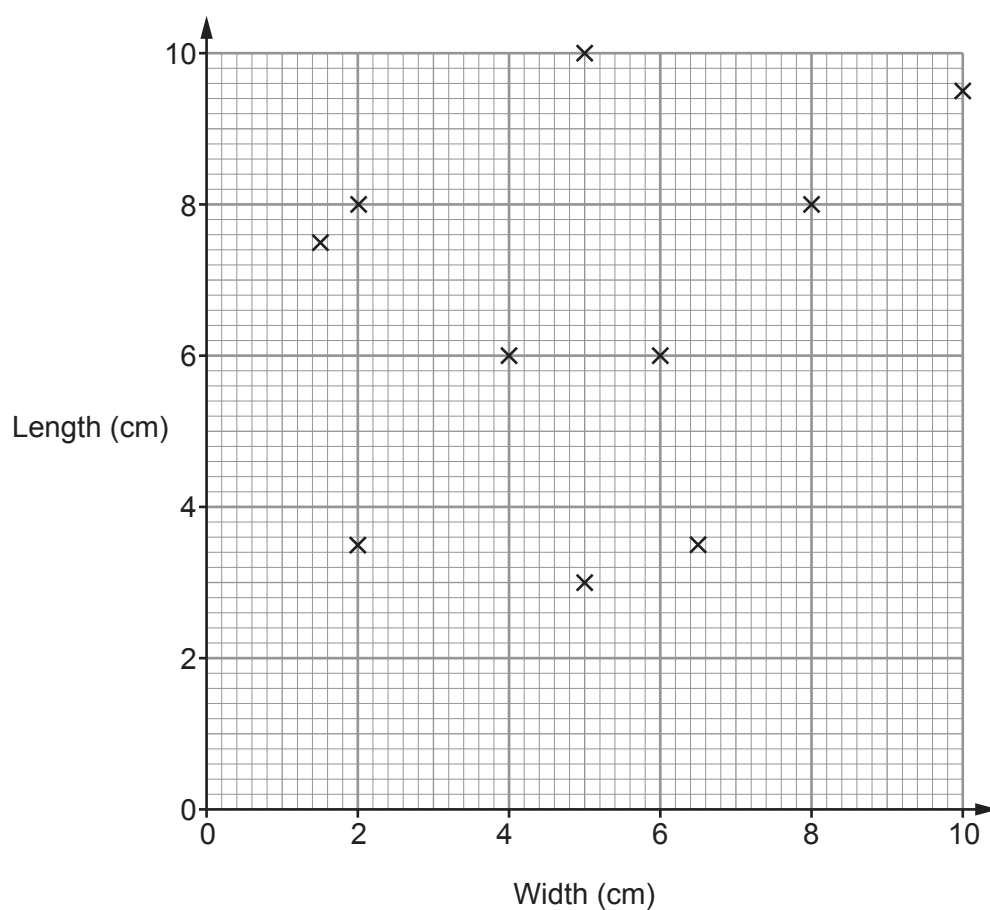
Asif's scatter diagram
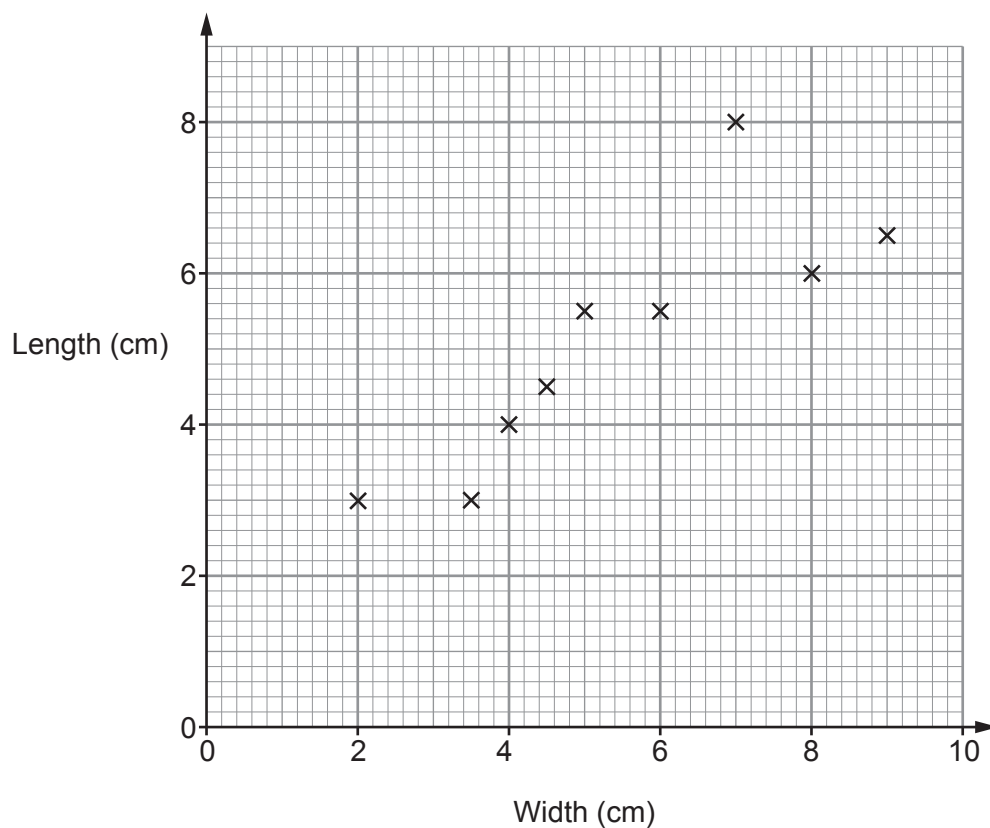


(i) One of the boys collected all of his leaves from one tree.

Who was this most likely to be?
Give a reason for your answer. [1]

☐ David          ☐ Asif

Reason: ........................................................................................................

..................................................................................................................

(ii) Draw a line of best fit on Asif's scatter diagram. [1]

(iii) Asif forgot to include the measurements of one of the leaves on his scatter diagram. The length of this leaf is 7 cm.

Write down an estimate of the width of this leaf. [1]

..................................................................................................................

© WJEC CBAC Ltd.          (C300U10-1)          **Turn over.**

**22.** Ivy mixes lemon juice, pineapple juice and orange juice in the ratio 1 : 2 : 7 to make a fruit drink.
Ivy has 330 ml of her fruit drink in a glass.

How much pineapple juice is in Ivy's glass? [2]

.........................................................................................................................................................................

.........................................................................................................................................................................

.........................................................................................................................................................................

.................................................... ml

**23.** The shape below consists of a square surrounded by four semi-circles.
The diameter of each semi-circle is 12 cm.
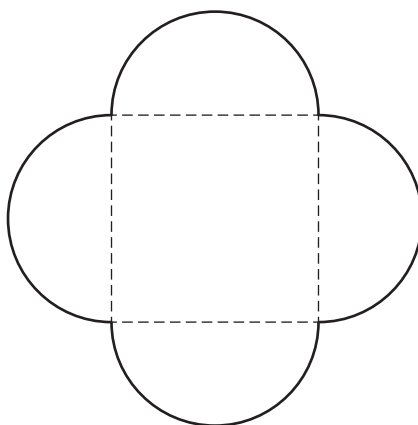


*Diagram not drawn to scale*

Work out the area of the shape.
Give your answer in the form $a + b\pi$. [4]

.........................................................................................................................................................................

.........................................................................................................................................................................

.........................................................................................................................................................................

.........................................................................................................................................................................

.........................................................................................................................................................................

.........................................................................................................................................................................

Area = .................................................... cm$^2$

(C300U10-1)

**24.** Izaan has a block of stainless steel with volume $700 \, cm^3$.
The stainless steel has a density of $7{\cdot}5 \, g/cm^3$.

Izaan says,

The block has a mass of less than 5 kg.

Is Izaan correct? [3]

☐ Yes          ☐ No          ☐ Cannot tell

Show how you decide.

..................................................................................................................................

..................................................................................................................................

..................................................................................................................................

..................................................................................................................................

..................................................................................................................................

..................................................................................................................................

..................................................................................................................................

..................................................................................................................................

..................................................................................................................................

..................................................................................................................................

..................................................................................................................................

(C300U10-1) **Turn over.**

**25.** Write 60 as a product of its prime factors in index form. [3]

..............................................................................................................................................................

..............................................................................................................................................................

..............................................................................................................................................................

..............................................................................................................................................................

..............................................................................................................................................................

..............................................................................................................................................................

..............................................................................................................................................................

..............................................................................................................................................................

..............................................................................................................................................................

60 = ....................................................

© WJEC CBAC Ltd. (C300U10-1)

Examiner only

**26.** The diagram below shows an **equilateral triangle** and a square.

8 cm

10 cm

$2x + 3$

$7x - 5y$

*Diagram not drawn to scale*

Use an algebraic method to find the value of $x$ and the value of $y$.
You must show all your working. [5]

.................................................................................................................................................................

.................................................................................................................................................................

.................................................................................................................................................................

.................................................................................................................................................................

.................................................................................................................................................................

.................................................................................................................................................................

.................................................................................................................................................................

.................................................................................................................................................................

.................................................................................................................................................................

.................................................................................................................................................................

.................................................................................................................................................................

$x = $ ......................................................

$y = $ ......................................................

© WJEC CBAC Ltd. (C300U10-1) **Turn over.**

**27.** Simplify $7\sqrt{2} \times 3$ [1]

..................................................................................................................................................................

..................................................................................................................................................................

**28.** Factorise $3xy^2 + 6x^2y$ [3]

..................................................................................................................................................................

..................................................................................................................................................................

..................................................................................................................................................................

..................................................................................................................................................................

**29.** Hans thinks of a number.
When his number is multiplied by $2 \cdot 4 \times 10^5$, the answer is $9 \cdot 6 \times 10^8$.

What number did Hans think of?
Write your answer in standard form. [2]

..................................................................................................................................................................

..................................................................................................................................................................

..................................................................................................................................................................

..................................................................................................................................................................

..................................................................................................................................................................

© WJEC CBAC Ltd. (C300U10-1)
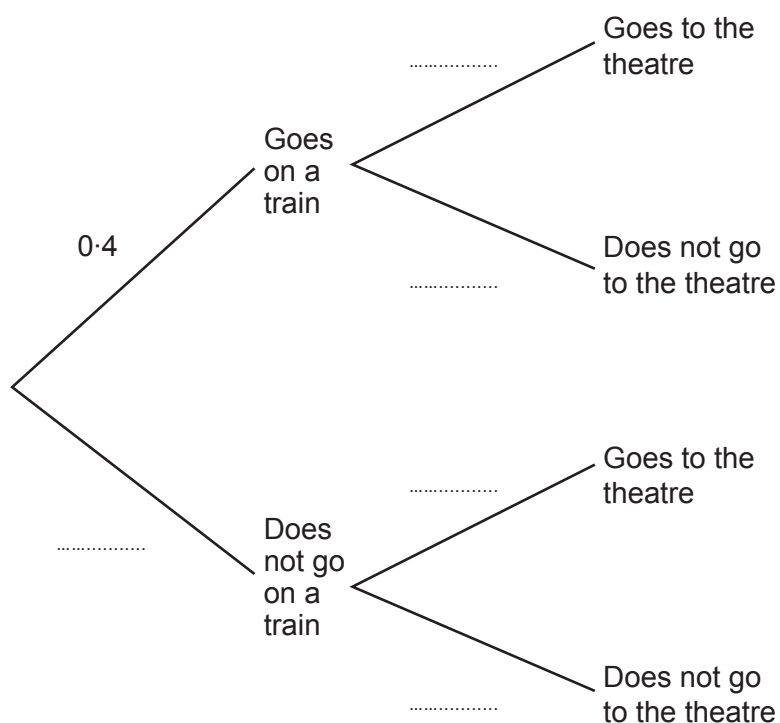
**30.** Kate is visiting London.

The probability that she will go on a train is 0·4.
The probability of Kate going to the theatre is independent of her going on a train.

The probability that she goes on a train and goes to the theatre is 0·28.

(a)   Complete the following tree diagram. [4]

..................................................................................................................................................

..................................................................................................................................................

..................................................................................................................................................



(b)   Calculate the probability that Kate does not go on a train and does not go to the theatre. [2]

..................................................................................................................................................

..................................................................................................................................................

..................................................................................................................................................

© WJEC CBAC Ltd.          (C300U10-1)          **Turn over.**

**31.** Show that the lines

$$3y - 12x = 9 \text{ and } 2y = 8x - 13$$

are parallel to each other. [3]

..........................................................................................................................................................

..........................................................................................................................................................

..........................................................................................................................................................

..........................................................................................................................................................

..........................................................................................................................................................

..........................................................................................................................................................

**32.** It takes 2 hours to empty 8 identical tanks of water using 9 identical pumps.

How long would it take to empty 2 of these tanks using 3 of these pumps? [3]

..........................................................................................................................................................

..........................................................................................................................................................

..........................................................................................................................................................

..........................................................................................................................................................

..........................................................................................................................................................

..........................................................................................................................................................

**END OF PAPER**

(C300U10-1)

| Question number | Additional page, if required. Write the question number(s) in the left-hand margin. | Examiner only |
|---|---|---|
| | | |

(C300U10-1)

**BLANK PAGE**

**PLEASE DO NOT WRITE
ON THIS PAGE**

(C300U10-1)

**BLANK PAGE**

**PLEASE DO NOT WRITE
ON THIS PAGE**

(C300U10-1)

**BLANK PAGE**

**PLEASE DO NOT WRITE ON THIS PAGE**

(C300U10-1)