GCSE

wjec cbac

3300U40-1

A17-3300U40-1

MATHEMATICS
UNIT 2: CALCULATOR-ALLOWED
INTERMEDIATE TIER

MONDAY, 13 NOVEMBER 2017 – MORNING

1 hour 45 minutes

3300U401 01

ADDITIONAL MATERIALS

A calculator will be required for 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 continuation page at the back of the booklet. Question numbers must be given for all work written on the continuation page.

Take π as 3·14 or use the π button on your calculator.

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.

In question **8**, the assessment will take into account the quality of your linguistic and mathematical organisation, communication and accuracy in writing.

For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1.	8	
2.	4	
3.	5	
4.	3	
5.	3	
6.	5	
7.	3	
8.	7	
9.	6	
10.	3	
11.	4	
12.	8	
13.	5	
14.	5	
15.	6	
16.	5	
Total	80	

1. *(a)* Calculate 8% of £3.25. [3]

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(b) Evaluate $0.65 \times 280 - \frac{2}{9}$ of 513. [3]

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(c) Calculate $3.5^2 - \sqrt{8.6}$.

Give your answer correct to 2 decimal places. [2]

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(3300U40-1) **Turn over.**

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03

2. (a) What is the difference between the following times?

   '07:30 on 1st November 2017'   and   '13:20 on 3rd November 2017'

   Give your answer in days, hours and minutes.

   [2]

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   .... days   .... hours   .... minutes

   (b) Divide 16 hours 20 minutes by 5.

   Give your answer in hours and minutes.

   [2]

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   .... hours   .... minutes

3. *(a)*

| 11 | 23 | 5 | 9 | 18 | 20 | |

A number is to be written on the blank card.

The mode and the median of all seven numbers are both the same.

Find one possible number that can be written on the blank card. [1]

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Number on card ....

(b) One extra number is added to the following list of three numbers.

<div align="center">6   8   13</div>

The mean of the new list of four numbers is 1 less than the mean of the original three numbers.

What number was added to the list? [4]

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Number added ....

(3300U40-1) **Turn over.**

4. *(a)* How would the direction **due west** be written as a three-figure bearing?
Circle your answer. [1]

360°   180°   090°   270°   000°

(b) There are 360° in a full turn.

A pointer facing **due south** is spun <u>clockwise</u> through $3\frac{3}{4}$ full turns.

In which direction will the pointer now face?
Circle your answer. [1]

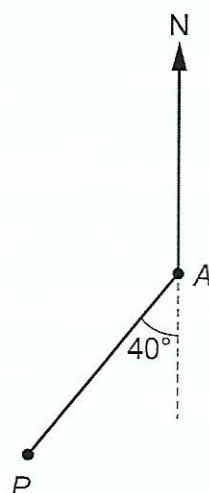north   south   west   east   none of these
                                                           directions

(c)

N

A

40°

P

What is the bearing of point *P* from point *A*?
Circle your answer. [1]

220°   040°   140°   320°   230°

(3300U40-1)

5. Calculate the area of the trapezium shown below.
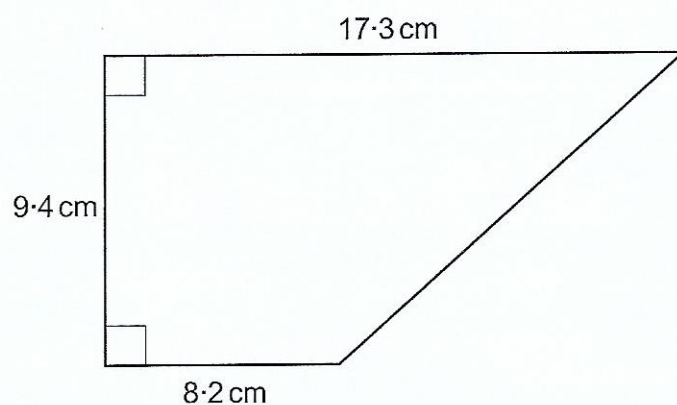   You must give the units of your answer.   [3]

17·3 cm

9·4 cm

8·2 cm

Diagram not drawn to scale

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(3300U40-1)   **Turn over.**

6. (a) Express 54 as a percentage of 129.
Give your answer to the nearest whole number. [3]

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(b) Share 25·8 kg in the ratio 5 : 1. [2]

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.... kg and .... kg

(3300U40-1)

7. The following cards spell out the name Ystradgynlais.

| Y | S | T | R | A | D | G | Y | N | L | A | I | S |

In an experiment, the cards are turned face down and rearranged.
A card is selected at random and the letter on the card is recorded.

The experiment is carried out 325 times.

How many times would you expect the letter **Y** to be recorded?   [3]

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© WJEC CBAC Ltd.   (3300U40-1)   **Turn over.**

8. *In this question, you will be assessed on the quality of your organisation, communication and accuracy in writing.*

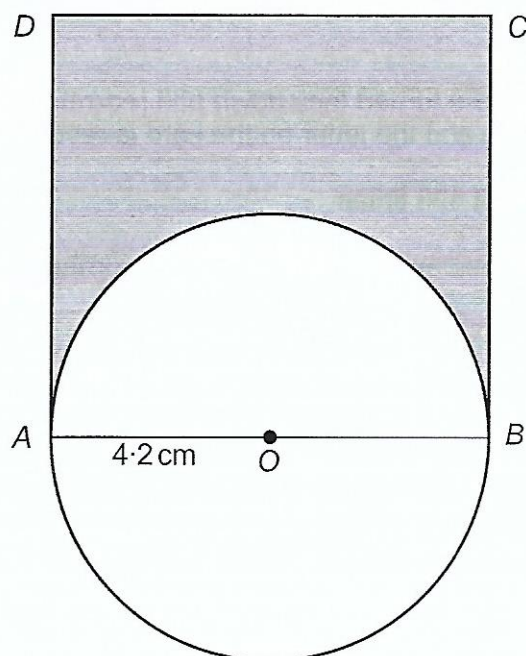AB is the diameter of a circle, centre O, with radius OA = 4·2 cm.
ABCD is a square.

Diagram not drawn to scale

Calculate the area of the shaded region.
You must show all your working.

[5 + 2 OCW]

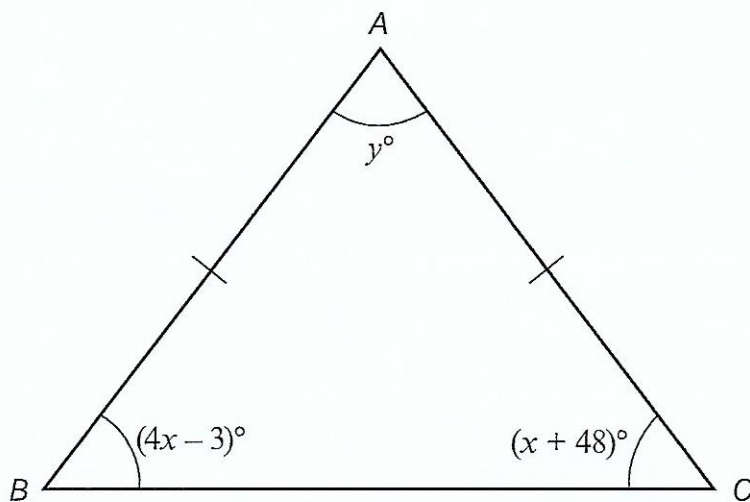(3300U40-1)

9. *ABC* is an isosceles triangle with *AB* = *AC*.

Diagram not drawn to scale

Calculate the value of y. [6]

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(3300U40-1) **Turn over.**

10. Simplify each of the following and circle the correct answer in each case.

(a) $6p^6 \times 3p^3$ [1]

$9p^9$ $\qquad$ $9p^{18}$ $\qquad$ $18p^{18}$ $\qquad$ $18p^2$ $\qquad$ $18p^9$

(b) $3 \cdot 4g^8 \div 13 \cdot 6g^2$ [1]

$\dfrac{g^4}{4}$ $\qquad$ $\dfrac{g^6}{4}$ $\qquad$ $4g^4$ $\qquad$ $4g^6$ $\qquad$ $0 \cdot 4g^6$

(c) $\dfrac{m^3 \times m^6}{m^9}$ [1]

1 $\qquad$ m $\qquad$ m^2 $\qquad$ m^4 $\qquad$ 4

11. A solution of the equation

$$x^3 + 2x = 91$$

lies between 4 and 5.

Use the method of trial and improvement to find this solution correct to 1 decimal place. You must show all your working. [4]

Turn over.

12. A triangular prism of length 2 metres is shown below.
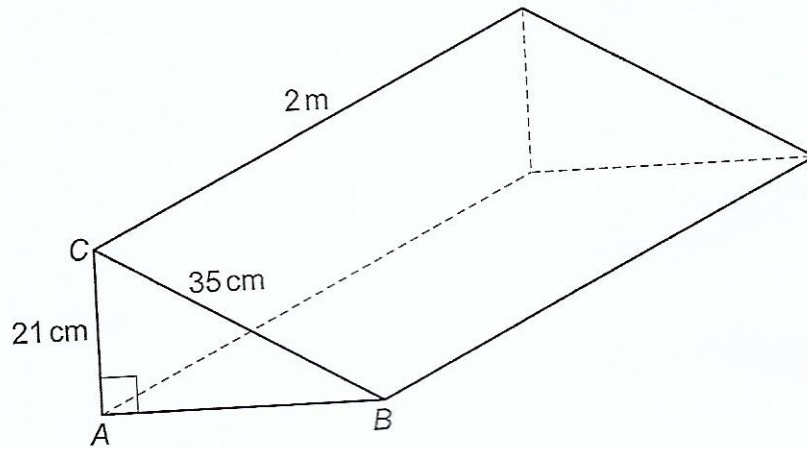

2 m

C

35 cm

21 cm

A

B

Diagram not drawn to scale

$AC = 21$ cm, $BC = 35$ cm and $B\hat{A}C = 90°$.

(a) Calculate the area of triangle *ABC*.
      Give your answer in cm^2.
      You must show all your working.

[5]

(3300U40-1)

(b) Calculate the volume of the prism.
You must give the units of your answer. [3]

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[5]

13. Find the answer to the following number problem.

'(the LCM of 12, 18 and 24) ÷ (the HCF of 36 and 54)'.

(3300U40-1)

14. *(a)* Rearrange the following formula to make x the subject.
Give your answer in its simplest form. [3]

$$2(x + y) = 7y - 3$$

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(b) Write down the nth term of the following sequence. [2]

$$3, \quad 6, \quad 11, \quad 18, \quad 27, \quad \ldots$$

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(3300U40-1)

Turn over.

15. The diagram shows two right-angled triangles, joined together along a common side.

$S\hat{P}Q = 90°$, $S\hat{Q}R = 90°$, $S\hat{Q}P = 38°$, $PS = 8\,cm$ and $QR = 15\,cm$.
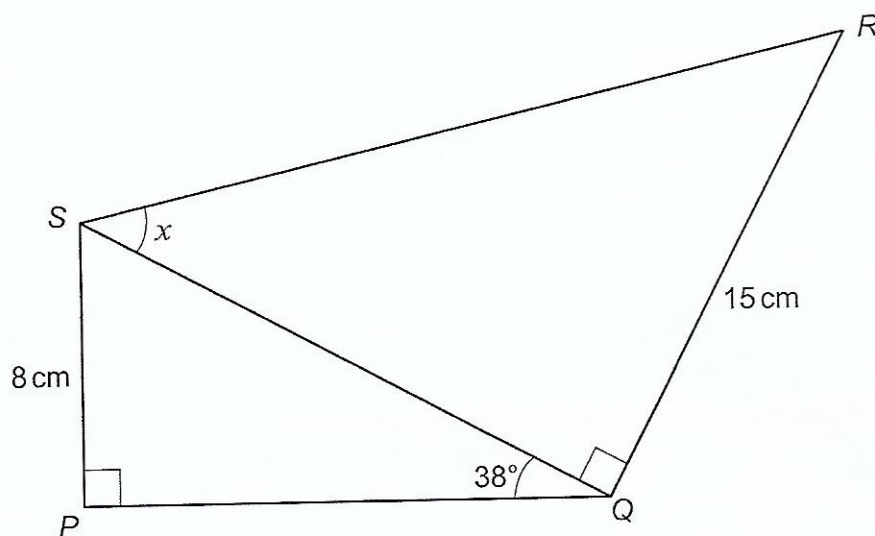
Diagram not drawn to scale

Calculate the size of angle x.

[6]

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(3300U40-1)

16. All the members of a farming club visited the Royal Welsh Agricultural Show.
They all travelled to the show either by bus or by car.
None of them visited the show on more than one day.
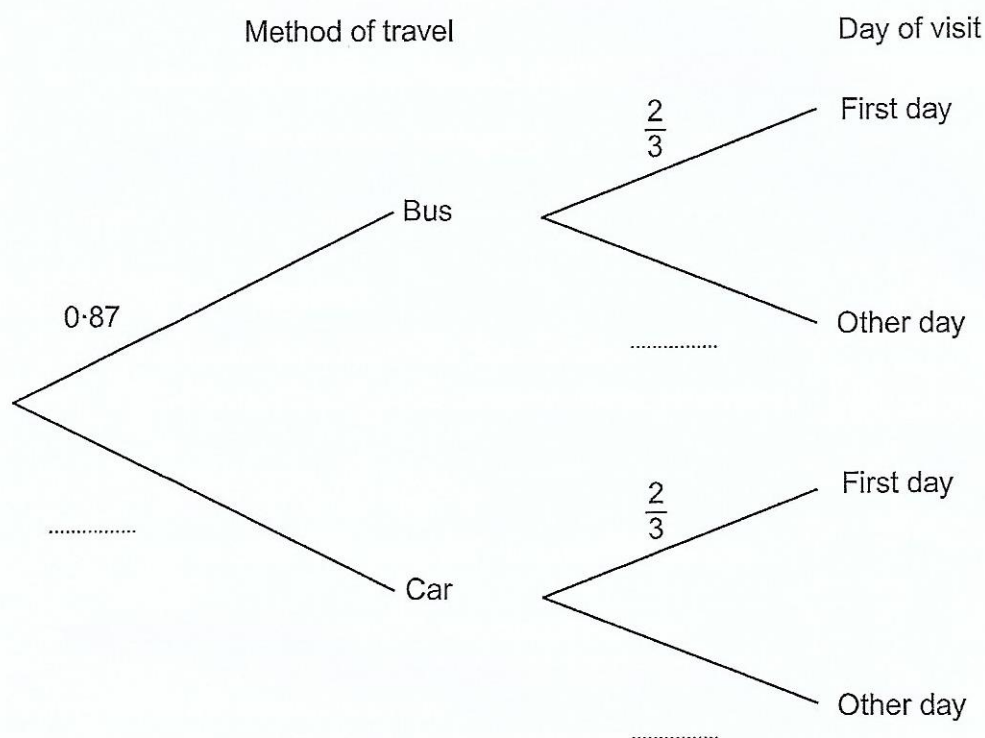The decision to travel by car or by bus was independent of the day of the visit.

A member of the club was selected at random.
The probability that this member travelled by bus was 0·87.

The probability that this member visited the show on the first day was $\frac{2}{3}$.

(a)   Complete the tree diagram shown below.   [2]

Method of travel   Day of visit

(b)   What is the probability that a member, chosen at random, was **not** one of those who travelled by bus on the first day of the show?   [3]

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END OF PAPER