| Surname | Centre Number | Candidate Number |
|---|---|---|
| Other Names | | 0 |

# GCSE

3300U40-1

A17-3300U40-1

# MATHEMATICS
## UNIT 2: CALCULATOR-ALLOWED
## INTERMEDIATE TIER

MONDAY, 13 NOVEMBER 2017 – MORNING

1 hour 45 minutes

**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 $\pi$ as 3·14 or use the $\pi$ 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** | |

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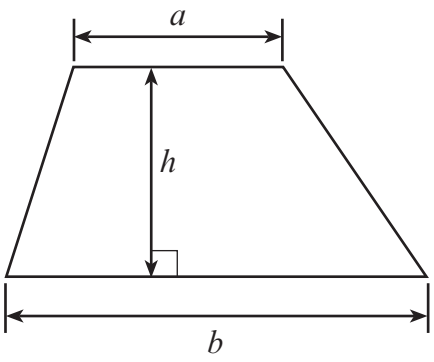
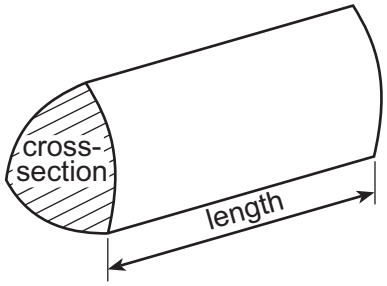
## Formula List – Intermediate Tier

**Area of trapezium** $= \frac{1}{2}(a + b)h$




**Volume of prism** = area of cross-section × length



Examiner only

**1.** *(a)* Calculate 8% of £3.25. [3]

*(b)* Evaluate $0{\cdot}65 \times 280 - \frac{2}{9}$ of 513. [3]

*(c)* Calculate $3{\cdot}5^2 - \sqrt{8{\cdot}6}$ .

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









**Turn over.**

Examiner only

**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]

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

*(b)* Divide 16 hours 20 minutes by 5.

Give your answer in hours and minutes. [2]

..... hours ..... minutes

Examiner only

**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.

6 8 13

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 .....









**Turn over.**

Examiner only

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

360° 180° 090° 270° 000°

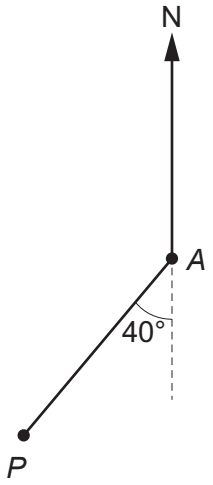
*(b)* There are 360° in a full turn.

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)*




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

220° 040° 140° 320° 230°

Examiner only

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

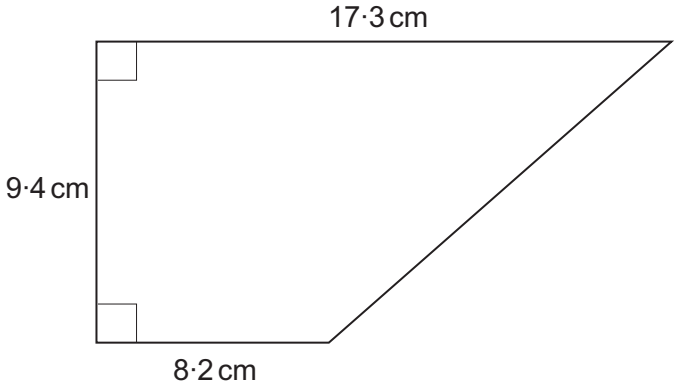



*Diagram not drawn to scale*









**Turn over.**

Examiner only

**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

Examiner only

**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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Examiner only

**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.

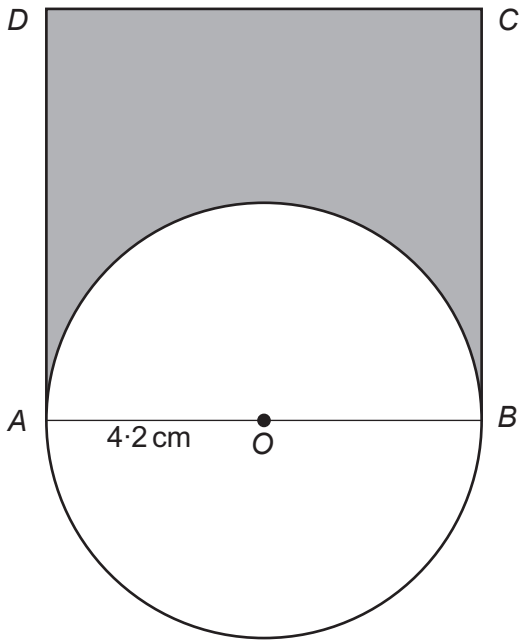


*Diagram not drawn to scale*

Calculate the area of the shaded region.
You must show all your working. [5 + 2 OCW]

Examiner only

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

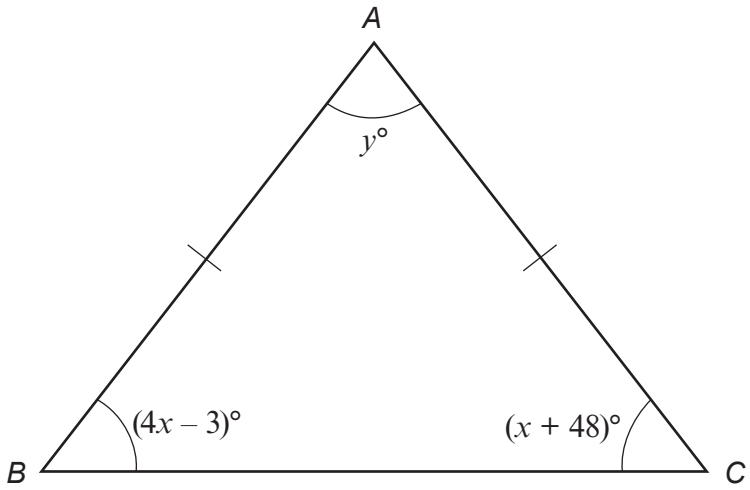


*Diagram not drawn to scale*

Calculate the value of $y$. [6]

Examiner only

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

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

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

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

$\frac{g^4}{4}$ $\frac{g^6}{4}$ $4g^4$ $4g^6$ $0{\cdot}4g^6$

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

$1$ $m$ $m^2$ $m^4$ $4$

Examiner only

**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]

Examiner only

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

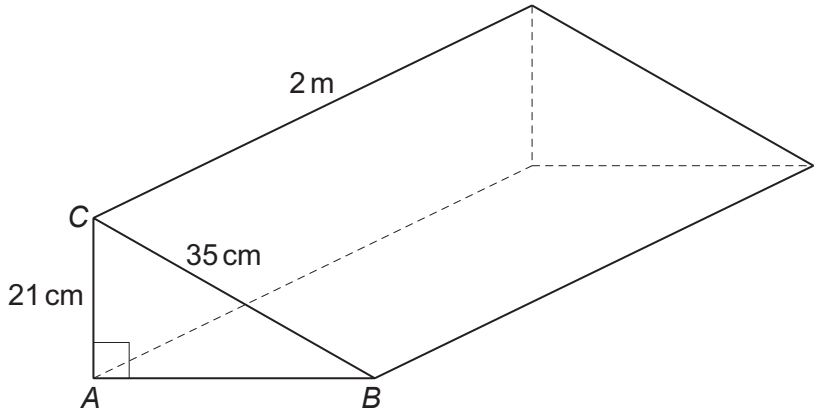


*Diagram not drawn to scale*

$AC = 21$ 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]

Examiner only

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

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Examiner only

**13.** Find the answer to the following number problem. [5]

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

Examiner only

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

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

*(b)* Write down the $n$th term of the following sequence. [2]

3, 6, 11, 18, 27, …

Examiner only

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

$S\hat{P}Q = 90°$, $S\hat{Q}R = 90°$, $S\hat{Q}P = 38°$, $PS = 8\,\text{cm}$ and $QR = 15\,\text{cm}$.

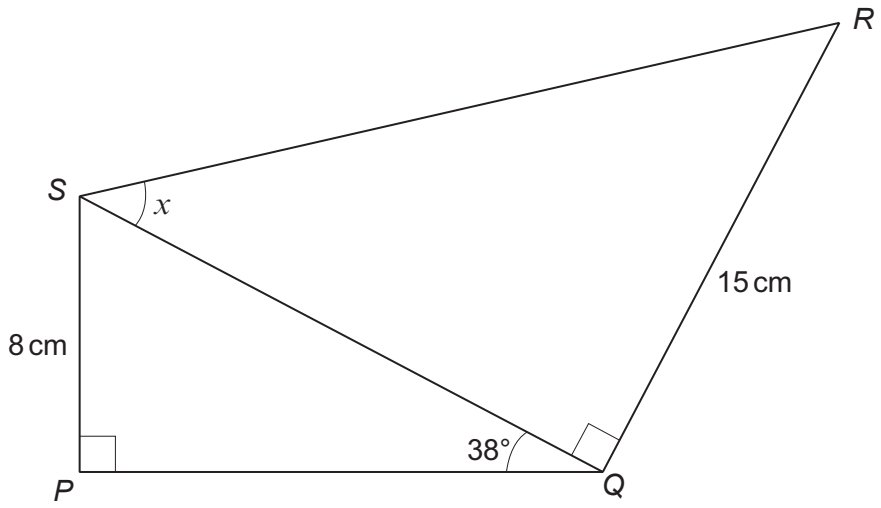



*Diagram not drawn to scale*

Calculate the size of angle $x$. [6]

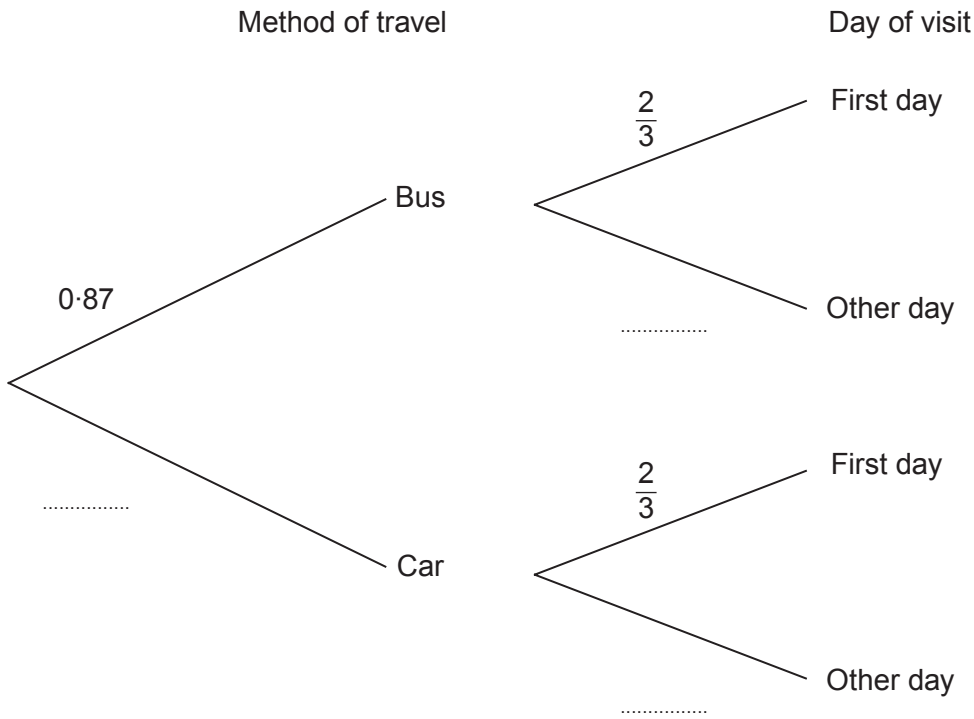
Examiner only

**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]




*(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**

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

Examiner only