

Surname
First name(s)

Centre Number

Candidate Number
0



**GCSE**

3310U40-1



**TUESDAY, 7 JUNE 2022 – MORNING**

**MATHEMATICS – NUMERACY  
UNIT 2: CALCULATOR-ALLOWED  
INTERMEDIATE TIER**

1 hour 35 minutes

**ADDITIONAL MATERIALS**

A calculator will be required for this paper.

A ruler, a 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 at the back of the booklet. Question numbers must be given for the work written on the additional 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 2(a), 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.	5	
2.	8	
3.	7	
4.	9	
5.	5	
6.	10	
7.	13	
8.	5	
9.	4	
10.	4	
<b>Total</b>	<b>70</b>	

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## Formula List – Intermediate Tier

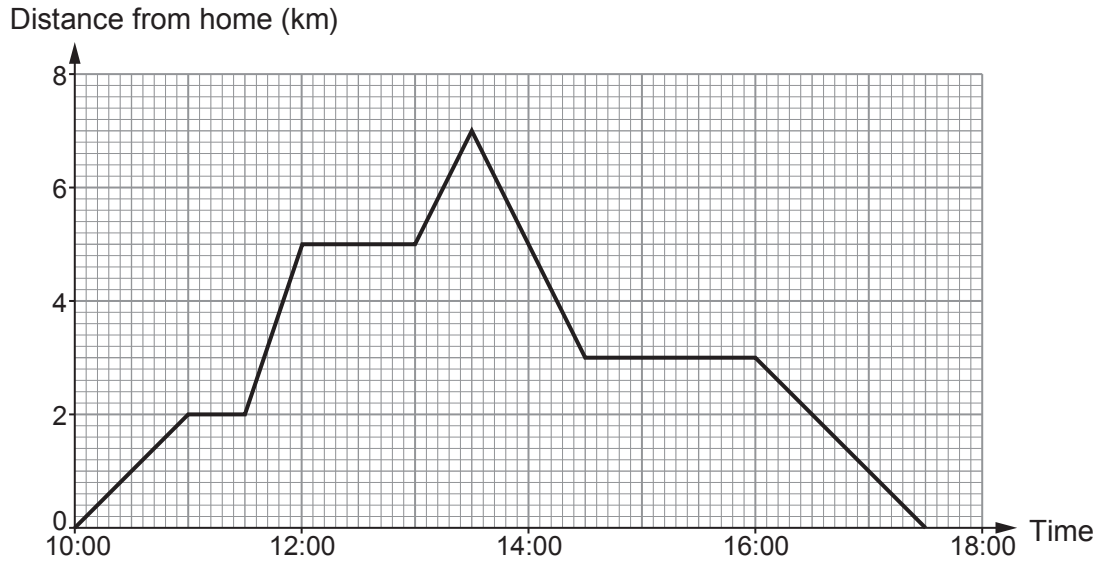
**Area of trapezium** =  $\frac{1}{2}(a + b)h$



**Volume of prism** = area of cross-section  $\times$  length



1. The travel graph below shows a journey Luke made on Saturday along a straight road.



(a) How far away from home was Luke at 17:00? [1]

..... km

(b) For what length of time was Luke away from home on this journey?  
Circle your answer. [1]

- $17\frac{1}{2}$  hours    
   $7\frac{1}{2}$  hours    
   $4\frac{1}{2}$  hours    
   $4\frac{3}{4}$  hours    
   $7\frac{1}{4}$  hours

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(c) During his journey, Luke visited a friend's house. He stopped for an hour and then continued his journey. How far from Luke's home does his friend live? [1]

..... km

(d) How many kilometres did Luke travel between 13:00 and 14:30? [2]

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2. (a) *In this part of the question, you will be assessed on the quality of your organisation, communication and accuracy in writing.*

Lewis has been told by his doctor to eat 2400 calories per day.

He has been told to eat 35% of these calories at breakfast.

Lewis's breakfast on Tuesday had a total of 860 calories.

By how many calories did his breakfast on Tuesday exceed the amount he should have eaten?

You must show all your working.

[3 + 2 OCW]

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- (b) The following information is stated on the packet of breakfast cereal.

Values for 100g of cereal					
Energy	Fat	Carbohydrates	Protein	Fibre	Salt
358 calories	3.7g	69g	15g	12g	0.3g

- (i) Express, in its simplest terms, the ratio Carbohydrates : Protein. [1]

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- (ii) A serving of cereal has a mass of 30g.  
Calculate the mass of carbohydrates in a serving of this cereal. [2]

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3. After taking her meter reading, Alys always works out her electricity bill. She has created a table to fill in, as shown below.

Period	Previous meter reading	Present meter reading	Number of units of electricity used
January, February and March 2022	4380	4900	.....
<b>Charge for electricity:</b> ..... units at <b>21p per unit</b>		£ .....	
<b>Standing charge:</b> 3 months at <b>£7.00 per month</b>		£ .....	
Total charges:		£ .....	
<b>VAT at 5%:</b>		£ .....	
<b>Amount to pay £ .....</b>			

Complete Alys's table to calculate her electricity bill.

[7]

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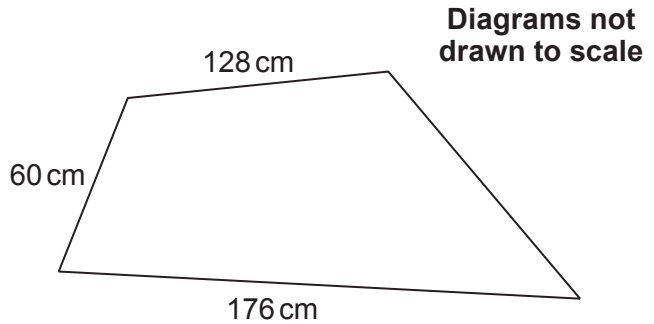
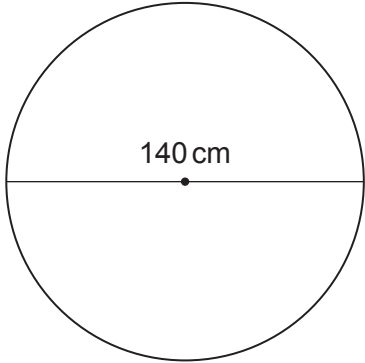
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4. (a) Esme has a pond and a flowerbed in her garden. The pond is circular and the flowerbed is in the shape of a quadrilateral, as shown below.



The diameter of the pond is 140 cm.  
The perimeter of the pond and the perimeter of the flowerbed are equal.

Esme needs to know the lengths of all the sides of her flowerbed.  
Complete the following statement for Esme.

"The lengths of the sides of the flowerbed are 176 cm, 128 cm, 60 cm  
and ..... cm."

You must show all your working.

[4]

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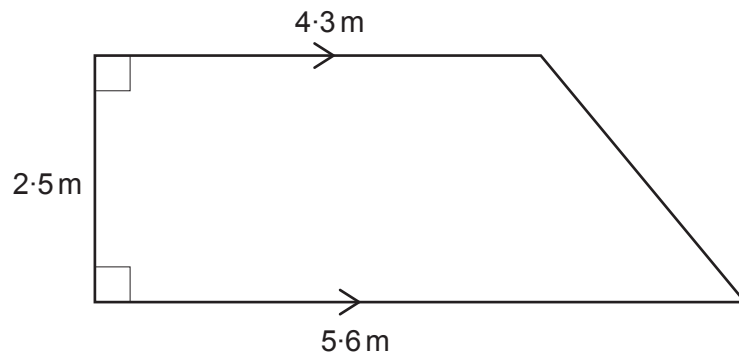
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- (b) Bill has a vegetable plot in his garden.  
It is in the shape of a trapezium, as shown below.



**Diagram not  
drawn to scale**

Fertiliser is sold in small bags.  
Each bag contains enough fertiliser to treat an area of  $0.9 \text{ m}^2$ .  
A bag of fertiliser costs £1.15.

How much will it cost Bill to buy enough bags of fertiliser to treat his vegetable plot?  
You must show all your working. [5]

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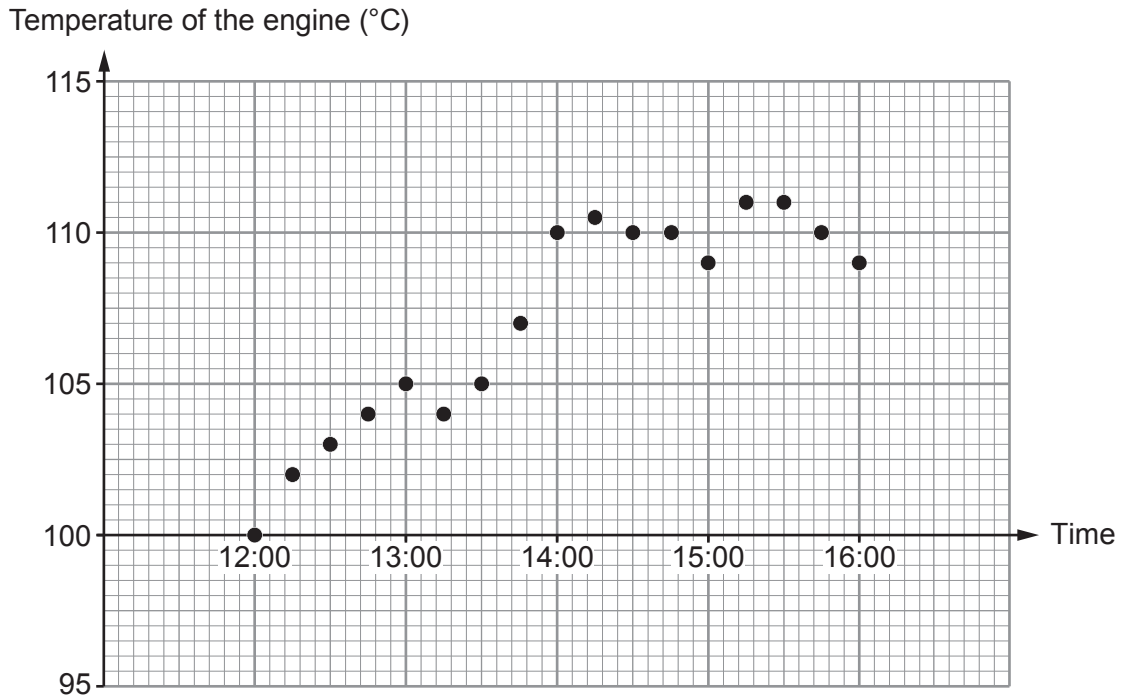
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5. An engine normally runs at  $100^{\circ}\text{C}$ .  
When the engine runs at  $110^{\circ}\text{C}$  or more, a warning light comes on.

A section of the temperature chart for the engine, from 12:00 to 16:00, is shown below.



- (a) How often was the temperature of the engine recorded?  
Circle your answer.

Every 5 minutes

Every 12 minutes

Every 15 minutes

Every  $2\frac{1}{2}$  minutes

Every 30 minutes

[1]

- (b) At what time was it first recorded that the warning light had come on?

[1]

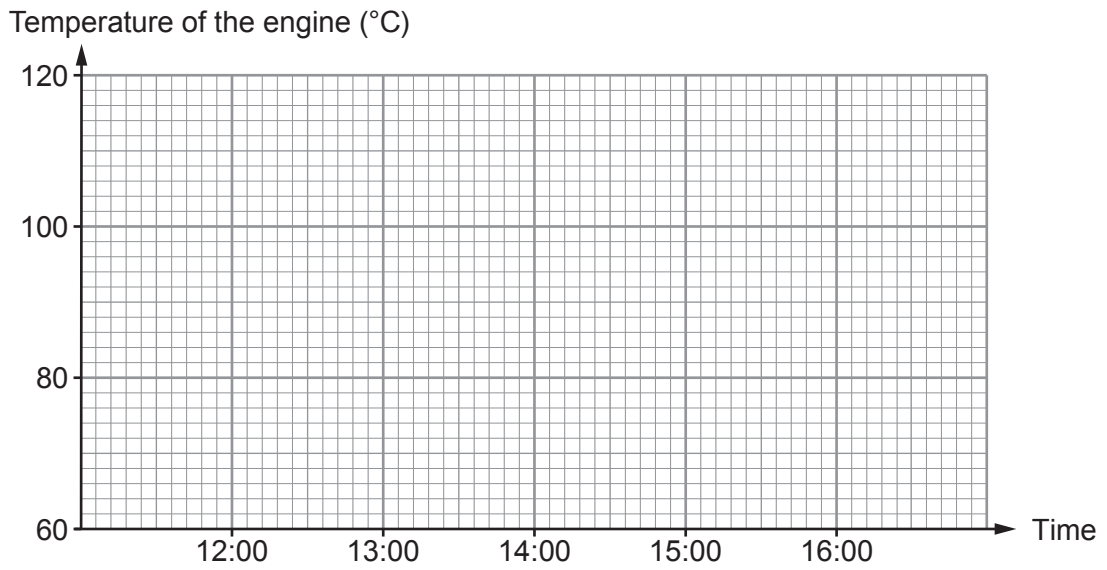
- (c) What was the range of the recorded temperatures of the engine between 12:00 and 16:00?

[1]





- (d) (i) Use the graph paper below to plot the recorded temperature of the engine at 12:00, 13:00, 14:00, 15:00 and 16:00 only. [1]



- (ii) Why is the graph you have drawn misleading? [1]

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6. (a) Last year, Janita recorded the number of miles she travelled each week in her car. She summarised the information in a frequency table, as shown below.

Number of miles, $x$	Frequency
$20 \leq x < 60$	4
$60 \leq x < 80$	8
$80 \leq x < 100$	11
$100 \leq x < 150$	12
$150 \leq x < 200$	17

- (i) In which group does the median weekly number of miles lie?  
Circle your answer.

[1]

$20 \leq x < 60$

$80 \leq x < 100$

$150 \leq x < 200$

$60 \leq x < 80$

$100 \leq x < 150$

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- (ii) Calculate an estimate of the mean number of miles Janita travelled each week in her car.

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- (b) Last month:
- Janita travelled 440 miles in her car
  - the cost of fuel was £1.30 per litre.

Janita's car averages 11 miles per litre of fuel.

Next month, she needs to budget for an increased travel cost.

Janita says,

The number of miles I travel will increase by 12%.  
The cost of fuel will increase by 10% next month.

Calculate how much Janita should budget for her car travel costs for next month.  
You must show all your working.

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7. Mito is a city in Japan.



(a) Complete the following statement.

[1]

"The bearing of Tokyo from Mito is .....°"

.....

(b) The road distance from Mito to Tokyo is 114 km.  
Anzu travelled by car from Mito to Tokyo in 1 hour 27 minutes.

Calculate the average speed of Anzu's journey.  
Give your answer in km/h.

[3]

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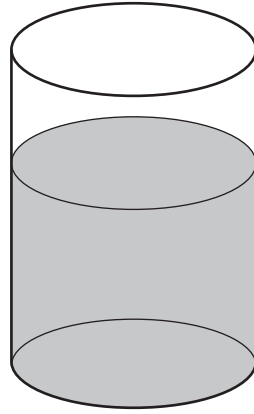




9. A cylindrical water tank has a radius of 36 cm.  
There are 80 litres of water in the tank.

Calculate the height of the water in the tank in centimetres.

[4]



**Diagram not  
drawn to scale**

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The height of the water in the tank is ..... cm



10. Last year, Khalida paid 2400 dollars income tax.  
The tax bands were as follows.

Band	Taxable income	Tax rate
Personal allowance	Up to 5000 dollars	0%
Basic rate	5000 dollars to 25 000 dollars	20%

Calculate Khalida's income before the deduction of tax.

[4]

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Khalida's income was ..... dollars

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