Surname	Centre Number	Candidate Number
First name(s)		0

GCSE

3310U30-1

A24-3310U30-1

TUESDAY, 5 NOVEMBER 2024 – MORNING

MATHEMATICS – NUMERACY
UNIT 1: NON-CALCULATOR
INTERMEDIATE TIER

1 hour 45 minutes

ADDITIONAL MATERIALS

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

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** questions.

Write your answers in the spaces provided in this booklet. 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.

Take π as 3·14.

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 **3**(c)(i), 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.	**10**	
3.	**15**	
4.	**4**	
5.	**3**	
6.	**5**	
7.	**2**	
8.	**6**	
9.	**5**	
10.	**8**	
11.	**6**	
12.	**8**	
Total	**80**	

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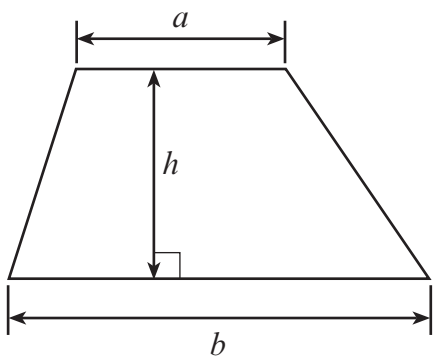
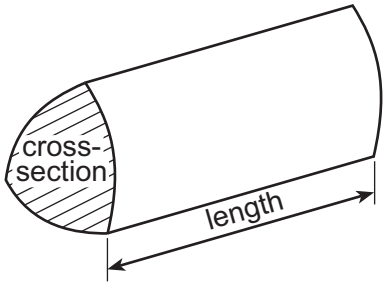
Formula List – Intermediate Tier

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



Volume of prism = area of cross-section × length



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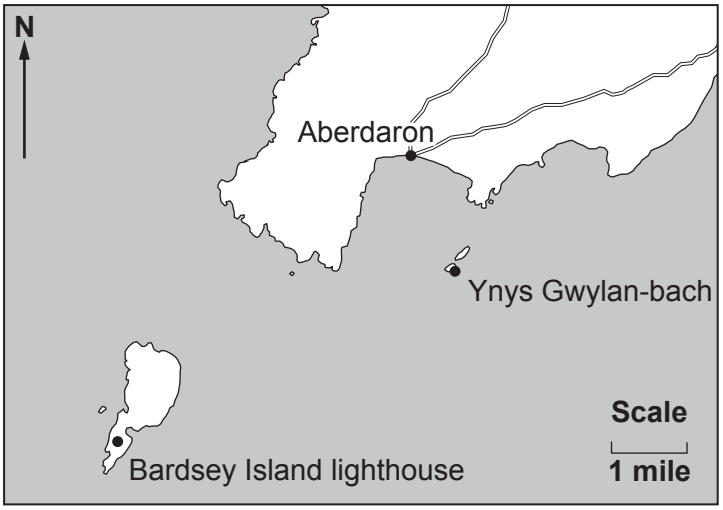
1. (a) The map below shows part of the coastline and some islands off the coast of Gwynedd.



(i) Write down the bearing of Aberdaron from Bardsey Island lighthouse. [1]

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(ii) Write down the bearing of Bardsey Island lighthouse from Ynys Gwylan-bach. [1]

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..... °

(iii) Huw can see Bardsey Island lighthouse from Ynys Gwylan-bach.
How far is the lighthouse from Ynys Gwylan-bach?
Give your answer in **kilometres**.
You must show all your working. [2]

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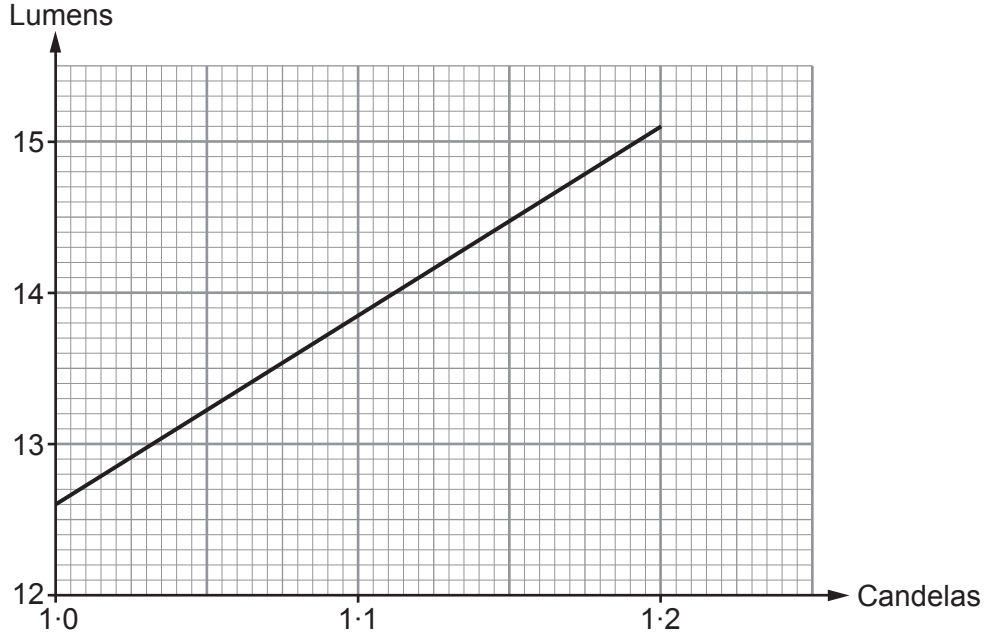
(b) The candela and the lumen are units that can be used to measure light intensity.

Below is a conversion graph.
You can use this graph to make approximate conversions between candelas and lumens for a particular type of light.



For this type of light, complete each of the following statements.

(i) 1·15 candelas is approximately equal to ..... lumens. [1]

(ii) 13·5 lumens is approximately equal to ..... candelas. [1]

(c) The light from Bardsey Island lighthouse has an intensity of approximately 52 000 candelas.
The light from Strumble Head lighthouse in Pembrokeshire has an intensity of approximately 1 000 000 candelas.

By estimating, complete the following statement.
You must show all your working. [2]

'The light from Strumble Head lighthouse is approximately ..... times as intense as the light from Bardsey Island lighthouse.'

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2. Maria makes and sells individual portions of salad.

(a) The tomatoes Maria needs to make 5 portions of salad cost her £1.75.
Calculate the cost of the tomatoes she needs to make 40 portions of this salad. [3]

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(b) Maria makes a salad dressing from oil and vinegar.
She uses oil and vinegar in the ratio 3 : 1.
Maria makes 280 ml of salad dressing.
Calculate the quantity of oil and the quantity of vinegar in the salad dressing. [3]

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Oil ..... ml

Vinegar ..... ml

(c) It costs Maria £24 to make 40 portions of salad.
She sells all these portions of salad for 90p each.

Calculate the **percentage** profit that Maria makes. [4]

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3. (a) Charlton Garden Centre sells plant pots and saucers.

40p

25p

At the garden centre, Enid buys twice as many plant pots as she does saucers.
The cost of a plant pot is 40p.
The cost of a saucer is 25p.
She spends £10.50 buying these plant pots and saucers.

Calculate how much Enid spends on buying the **saucers**.
You must show all your working. [3]

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Enid spends £ ..... buying the **saucers**

(b) Charlton Garden Centre sells packets of wild flower seeds.

Bee Flower Mix
1 g packet of seeds
£2.49

Cornfield Flower Mix
5 g packet of seeds
£15

Butterfly Flower Mix
3 g packet of seeds
£7.20

Which of the three different packets of seeds is the best value for money?

Bee Flower Mix ☐ Cornfield Flower Mix ☐ Butterfly Flower Mix ☐

You must show all your working. [4]

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

Gareth buys packets of Cosmos flower seeds to sow in a part of his garden.
The diagram below shows this part of his garden.

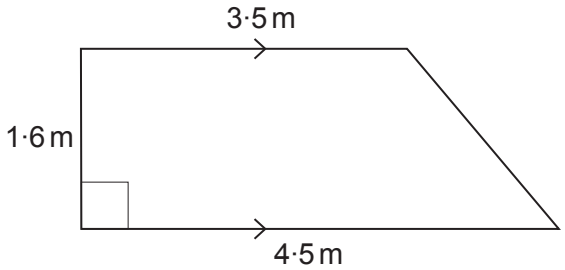

Diagram not drawn to scale

A 2·5 g packet of Cosmos seeds costs £8.20.
Gareth needs 1 gram of Cosmos seeds to sow an area of 1 m^2.

Calculate how much it costs Gareth to buy the packets of Cosmos seeds he needs to sow this part of the garden.
You must show all your working. [5 + 2 OCW]

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(ii) There are 105 Cosmos seeds in each gram.
How many seeds are there in 10 kg?
Circle your answer. [1]

1050 10 500 105 000 1 050 000 10 500 000

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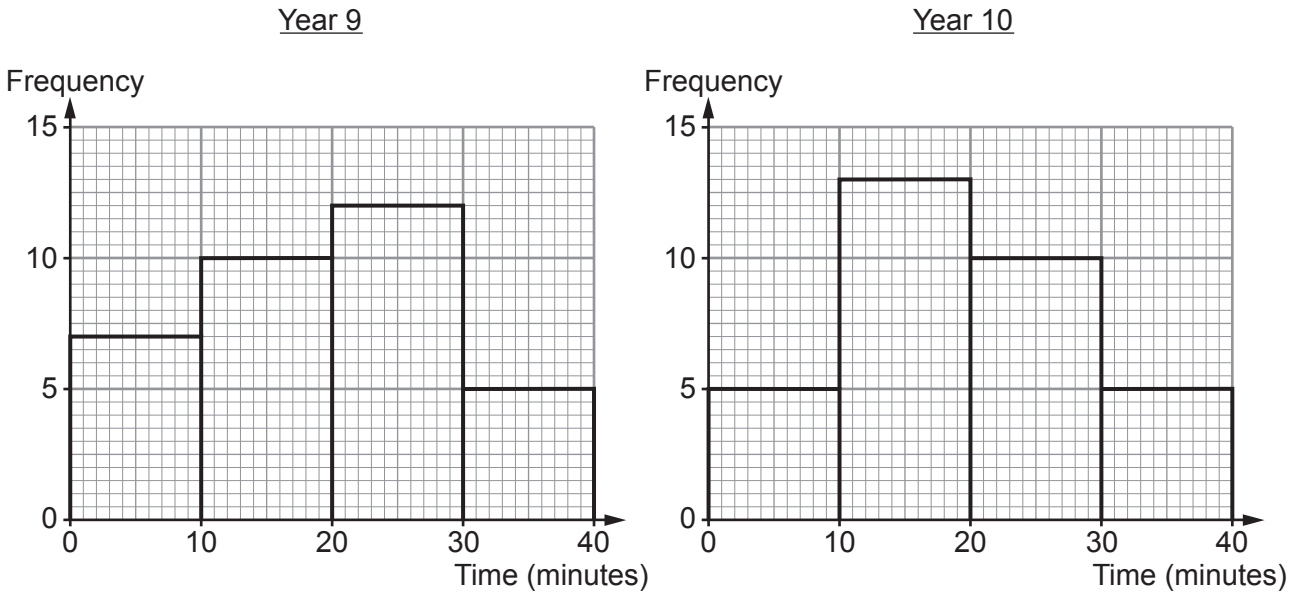
4. Miss Hughes asked her class of Year 9 pupils and her class of Year 10 pupils how many minutes they each spent on their mathematics homework last weekend.

The frequency diagrams below show the results.
The groups used are as follows:

$0 \leqslant \text{time} < 10, \quad 10 \leqslant \text{time} < 20, \quad 20 \leqslant \text{time} < 30 \quad \text{and} \quad 30 \leqslant \text{time} < 40.$



(a) What is the modal group of the times for the Year 9 pupils? [1]

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(b) How many of the Year 10 pupils spent 20 minutes or more on their mathematics homework last weekend? [1]

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(c) Did any of the Year 10 pupils spend **no** time on their mathematics homework last weekend?

Yes ☐ No ☐ Can't tell ☐

You must give a reason for your answer. [1]

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(d) Delyth calculates the following:
- the fraction of the Year 9 pupils who spent between 30 and 40 minutes on their homework
- the fraction of the Year 10 pupils who spent between 30 and 40 minutes on their homework.

Delyth says,

"These fractions are exactly the same."

Is Delyth correct?

Yes ☐ No ☐

You must give a reason for your answer. [1]

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5. Dilwyn asked 20 people how many pets each of them owned.

The results are shown in the table below.

Number of pets	0	1	2	3
Number of people	8	4	6	2

Calculate the mean number of pets owned by these 20 people.
You must show all your working. [3]

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6. Gerallt is planning to go to the Maldives.

His local exchange shop:

- sells **20 Maldivian rufiyaa** (MVR) for **£1**
- takes all possible British notes and coins
- sells MVR notes, but only has 500 MVR and 1000 MVR notes available.

Gerallt has £360 to buy Maldivian rufiyaa (MVR).

Calculate:

- the maximum number of Maldivian rufiyaa (MVR) that Gerallt can buy
- how much this will cost him.

You must show all your working. [5]

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Maximum number of Maldivian rufiyaa (MVR) is .....

The cost is £ .....

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7. Eleri is investigating whether people working in offices are happy with the processing speed of their office computer.
She considers the data she needs to collect.

Eleri includes the following two questions in her questionnaire.
For each question, write down one set of possible groups she could use as answer options.
[2]

Question 1: How many days per month do you work in your office?

Possible groups for answer:

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Question 2: How happy are you with the processing speed of your office computer?

Possible groups for answer:

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8. Jamal is paid in dollars.
The income tax rates are as follows:

Band	Taxable income	Tax rate
Personal allowance	Up to 10 000 dollars	0%
Basic rate	10 000 dollars to 30 000 dollars	10%
Higher rate	Over 30 000 dollars	25%

Jamal's total earnings before tax are 36 000 dollars.

Calculate how much tax Jamal is due to pay in total.
You must show all your working. [6]

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9. A fire surround is made from concrete.

The fire surround has a uniform cross-section.
The edges of the fire surround are all either horizontal or vertical, as shown in the diagram.

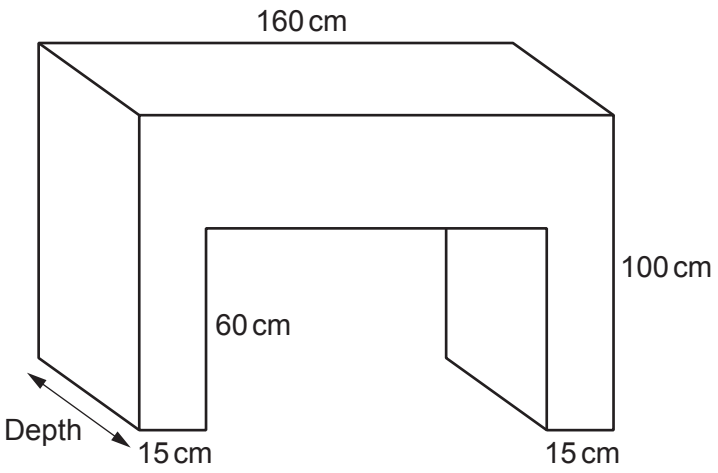

Diagram not drawn to scale

The volume of the concrete in the fire surround is 164 000 cm^3.

Calculate the depth of the fire surround.
Give your answer in centimetres.
You must show all your working. [5]

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Depth of fire surround is ..... cm

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10. (a) Delia invests £4000 in an account that pays 3% compound interest per annum. She does not withdraw money or make any other payments into her account.

How much will Delia have in her account after **two years**? [3]

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Amount in Delia's account after two years £ .....

(b) Delia bought a gold bracelet at a car boot sale a few years ago.

(i) Delia's bracelet has increased in value by 40%. Her gold bracelet is now worth £42.

Calculate how much Delia paid for the bracelet in the car boot sale. [2]

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Delia paid £ .....

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(ii) The density of the gold in Delia's bracelet is 20 g/cm^3.
The bracelet has a mass of 6×10^{-3} **kilograms**.

Calculate the volume of Delia's bracelet.
Give your answer in cm^3. [3]

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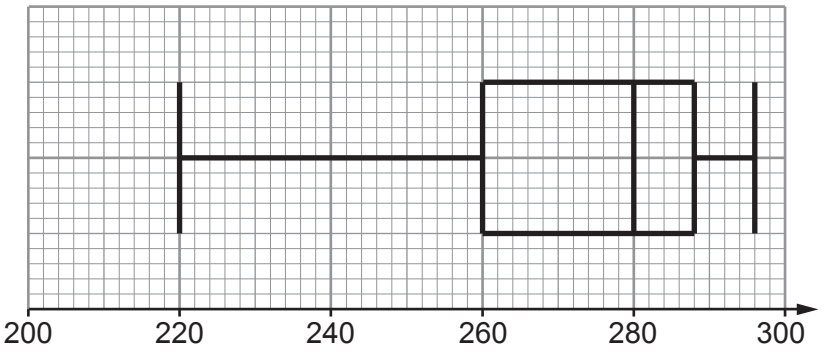
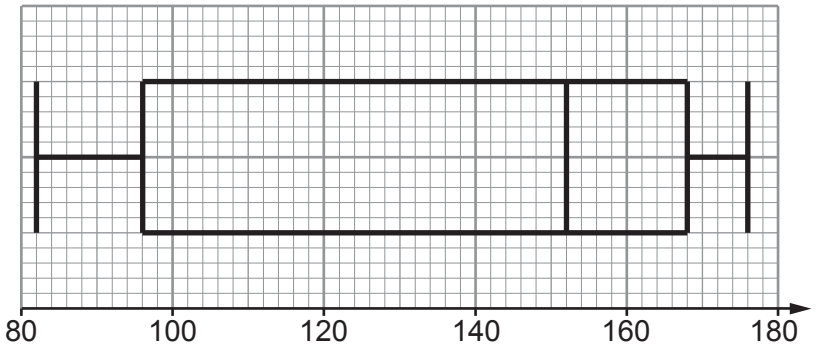
11. Geraint has collected data on some adult gulls.
He weighed 400 slender-billed gulls, 400 little gulls, and 400 black-headed gulls.

He has constructed box-and-whisker diagrams to display the masses of the gulls.

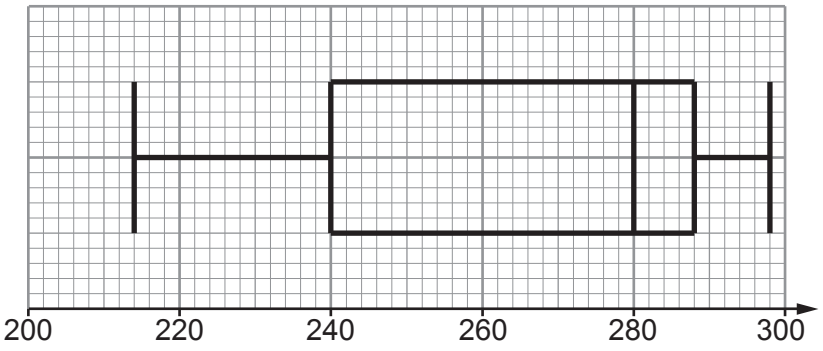
Slender-billed gulls



Little gulls



Black-headed gulls



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(a) What is the range of the masses of the slender-billed gulls? [1]

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Range of the masses ..... g

(b) How many of the little gulls have a mass greater than or equal to 96 g? [2]

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(c) Write down the percentage of little gulls that have a mass greater than or equal to 168 g. [1]

..... %

(d) From the box-and-whisker diagrams, Geraint notices that two of the types of gull have the same median mass.
He makes the following statement about these two types of gull.

"The diagrams suggest that one of these two types of gull generally has a greater mass than the other."

(i) Which type of gull appears to have the greater mass? [1]

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(ii) Geraint based his statement on **one** of the following measures.
Which measure did Geraint use?
Circle your answer. [1]

Range Median Lowest mass Lower quartile Upper quartile

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12. Shipping containers are used to transport goods around the world.
The dimensions of a shipping container are as follows:

- The height is 2·59 m, correct to the nearest centimetre.
- The width is 2·43 m, correct to the nearest centimetre.
- The length is approximately double the width.

(a) What is the least possible **width** of this shipping container?
Circle your answer. [1]

2·425 m 2·42 m 2·435 m 2·426 m 2·424 m

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(b) An end view of a stack of these shipping containers is shown below.

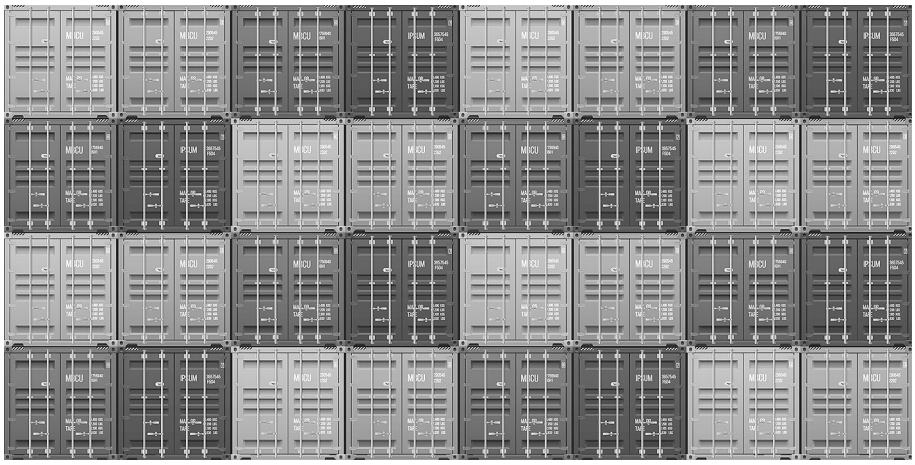

Diagram not drawn to scale

(i) Calculate the greatest possible **height** of the stack of shipping containers.
Give your answer in metres. [3]

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(ii) There are 32 shipping containers in this stack.
Sketch the plan view of this stack of shipping containers in the space below. [1]

(c) In 2012, there were 2×10^7 shipping containers in the world.

Joshua says,

> By 2025, I think that the number of shipping containers in the world will reach $1{\cdot}2 \times 10^8$.

Assuming Joshua is correct, complete the statement below.

"By 2025, the percentage increase in the number of shipping containers in the world since 2012 will be ..... %."

You must show all your working. [3]

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END OF PAPER

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

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