OCR
RECOGNISING ACHIEVEMENT

F

GENERAL CERTIFICATE OF SECONDARY EDUCATION

MATHEMATICS A

A503/01

Unit C (Foundation)

Candidates answer on the Question Paper

OCR Supplied Materials:
None

Other Materials Required:
- Geometrical instruments
- Tracing paper (optional)
- Scientific or graphical calculator

SPECIMEN

Duration: 1 hours 30 minutes

Candidate Forename		Candidate Surname	

Centre Number						Candidate Number				

INSTRUCTIONS TO CANDIDATES

- Write your name clearly in capital letters, your Centre Number and Candidate Number in the boxes above.
- Use black ink. Pencil may be used for graphs and diagrams only.
- Read each question carefully and make sure that you know what you have to do before starting your answer.
- Your answers should be supported with appropriate working. Marks may be given for a correct method even if the answer is incorrect.
- Answer **all** the questions.
- Do **not** write in the bar codes.
- Write your answer to each question in the space provided.

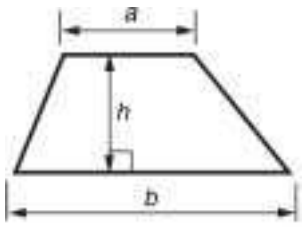
INFORMATION FOR CANDIDATES

- The number of marks is given in brackets **[ ]** at the end of each question or part question.
- Use the π button on your calculator or take π to be 3·142 unless the question says otherwise.
- Your Quality of Written Communication is assessed in questions marked with an asterisk (*).
- The total number of marks for this paper is **100**.
- This document consists of **24** pages. Any blank pages are indicated.

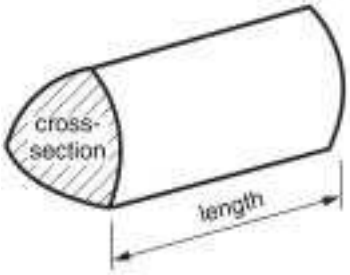
You are permitted to use a calculator for this paper.

Formulae Sheet: Foundation Tier

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



Volume of prism = (area of cross-section) × length



PLEASE DO NOT WRITE ON THIS PAGE

1 Work out.

(a) $\frac{1}{7}$ of £56

(a) £ _____ **[1]**

(b) $\frac{3}{5}$ of 45 kg

(b) _____ kg **[2]**

(c) 15% of £80

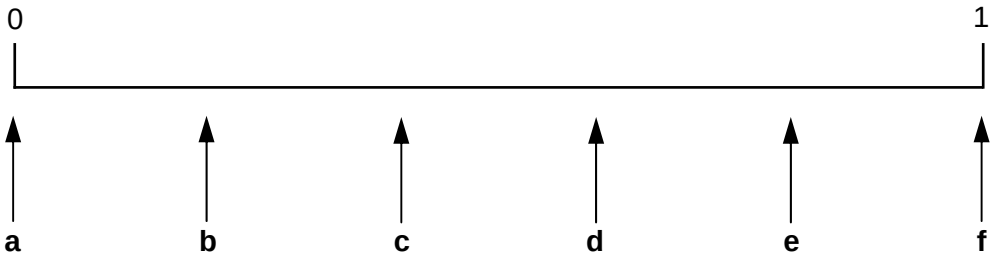
(c) £ _____ **[2]**

(d) $\frac{1}{3} \times \frac{2}{5}$

(d) _____ **[1]**

2 **(a)** Sanjiv has these five numbered discs.

He takes one without looking.



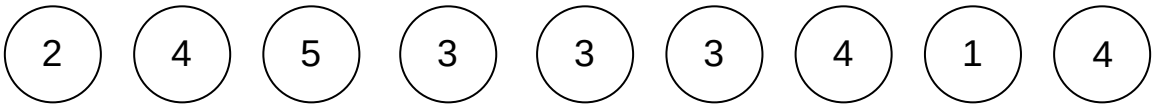
Complete these sentences.

Arrow _____ points to the probability that he chooses a **5**.

Arrow **d** points to the probability that Sanjiv chooses a _____.

Arrow _____ points to the probability that he chooses a number less than 2. **[3]**

(b) Katie has these nine numbered discs.



She takes one without looking.

What is the probability that

(i) she takes a 3,

(b)(i) _____ **[1]**

(ii) she takes a number **less than** 6?

(ii) _____ **[1]**

(c) Does Katie or Sanjiv have the greater chance of picking an even number?
Explain your reasoning.

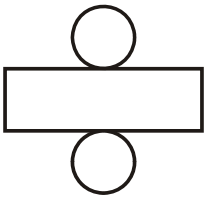
_____

_____ **[2]**

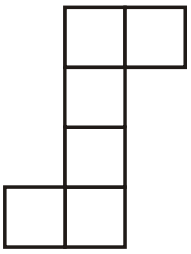
3 Here are the names of some solids.

sphere cuboid pyramid cone cube cylinder

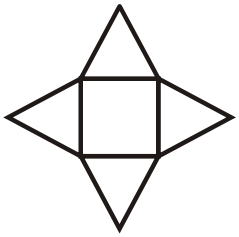
Choose a word from the list to complete each of these statements.



is the net of a _____



is the net of a _____



is the net of a _____

[3]

4 The table shows the coldest temperatures in some places of the UK recorded in March last year.

London	5°C
Manchester	-1°C
Sheffield	-2°C
Fort William	-7°C
Plymouth	7°C

(a) Write down the lowest of these temperatures.

(a) _____ °C **[1]**

(b) Which two places had a difference of 9°C?

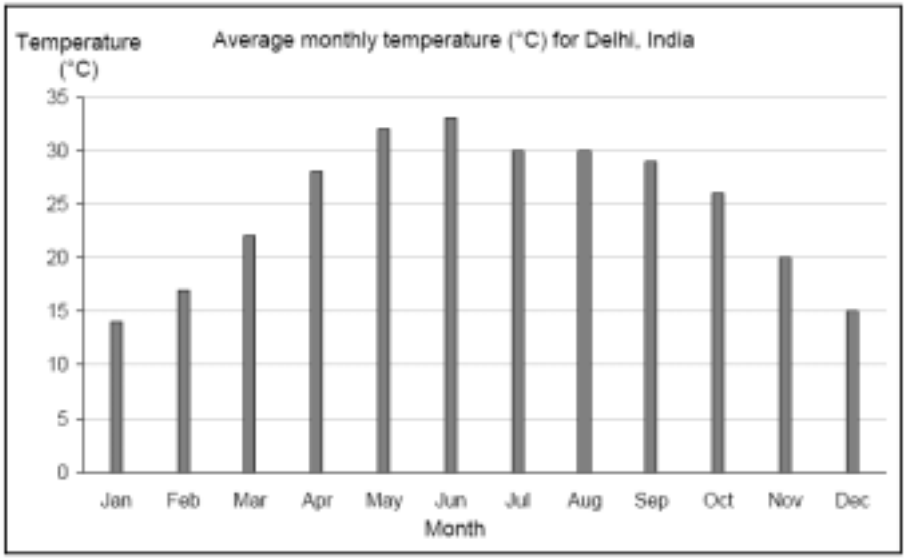
(b) _____ and _____ **[1]**

(c) In May, the coldest temperature in Sheffield was 5°C higher than the temperature in March.

What was the coldest temperature in Sheffield in May?

(c) _____ °C **[1]**

(d) Here is a collection of tables and charts about the average monthly weather for Delhi, India.



Average number of days with thunderstorms												
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Days	1	2	3	2	4	5	6	5	2	1	1	1

Average rainfall (cm)												
Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rain	2	2	1	1	1	6	20	20	12	1	1	1

Mikal has a gap year before going to college.
He wants to visit a friend in Delhi.
He likes an average temperature above 25°C but not above 30°C.
Unfortunately he is not too keen on thunderstorms or too much rain either.

Looking at the weather data, which would be the best month for Mikal to visit Delhi?
State values from the tables and charts to support your answer.

_____ because _____

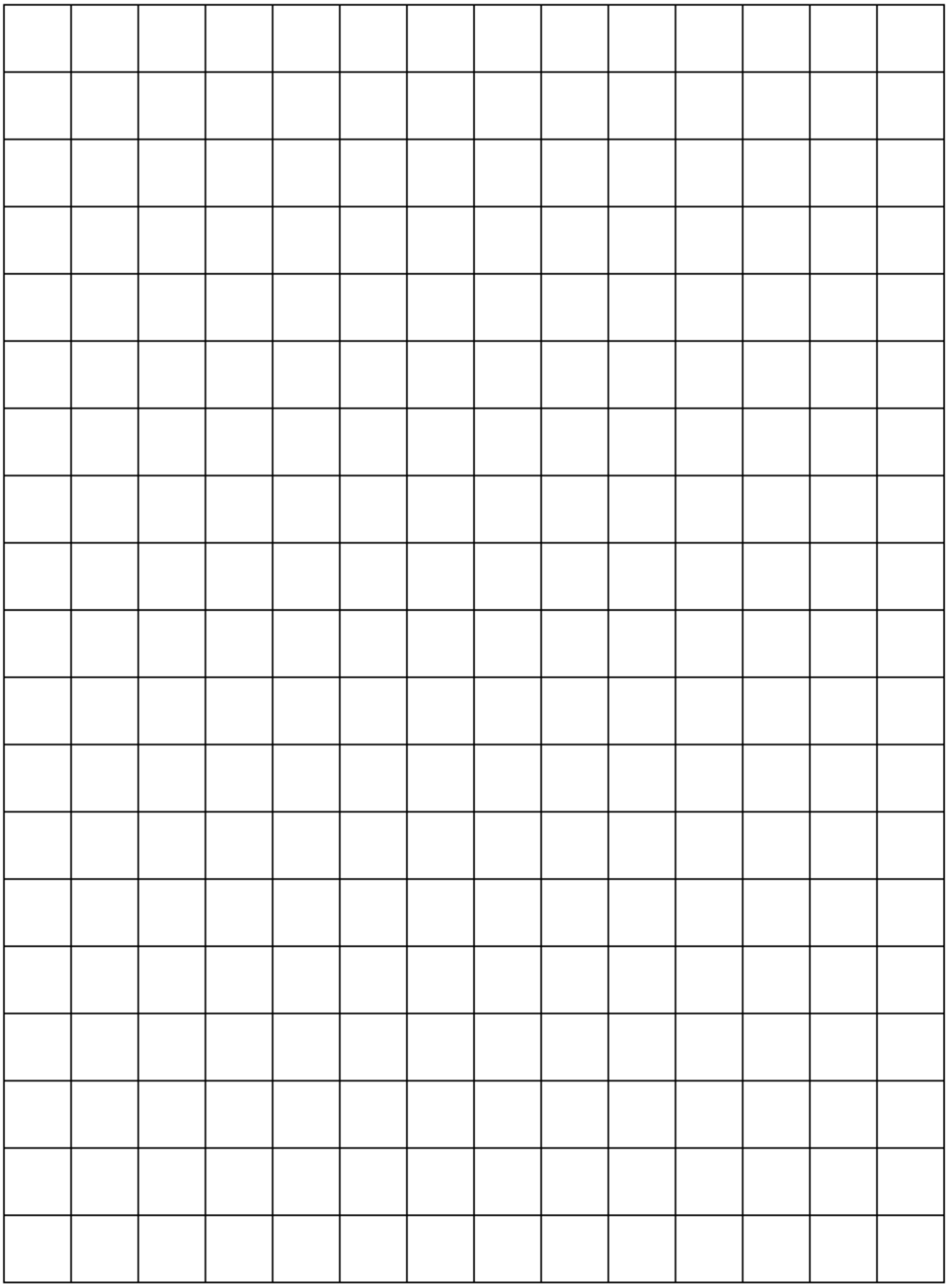
_____

_____ **[5]**

5 Rhiannon wishes to make a patio in her garden.
The patio must be **rectangular** and must have a perimeter of exactly 16 m.

(a) On the grid below sketch three **different** patios for Rhiannon.

Scale: 1 cm represents 1 m



[3]

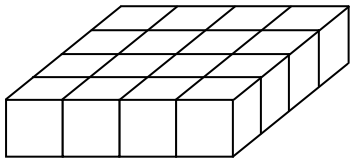
(b) Rhiannon will pave her patio using square slabs of side length 1 m.
Each slab costs £3·60.

Compare the costs of paving each of your three patios in part **(a)**.

[3]

6 Heather is stacking boxes.

(a) This is the first layer.



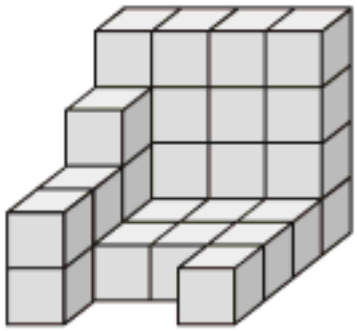
(i) How many boxes are there in this layer?

(a)(i) _____ **[1]**

(ii) How many boxes would there be in 4 of these layers?

(ii) _____ **[1]**

(b) Here are some boxes in another stack.



(i) How many boxes are in this stack?

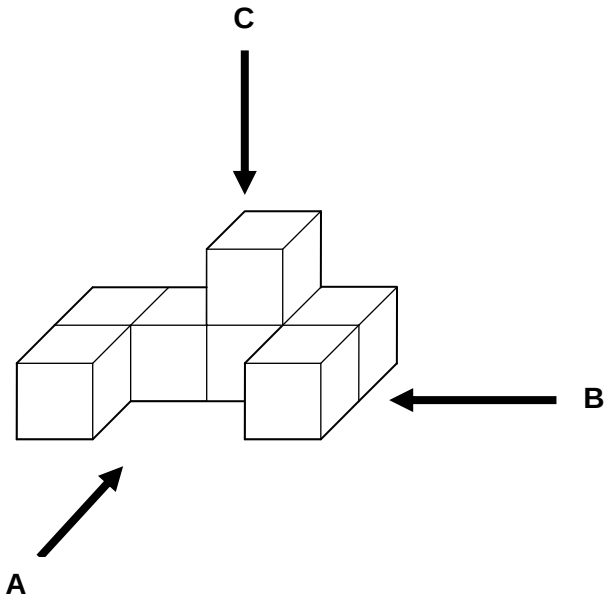
(b)(i) _____ **[1]**

(ii) How many more boxes are needed to make an exact cube?

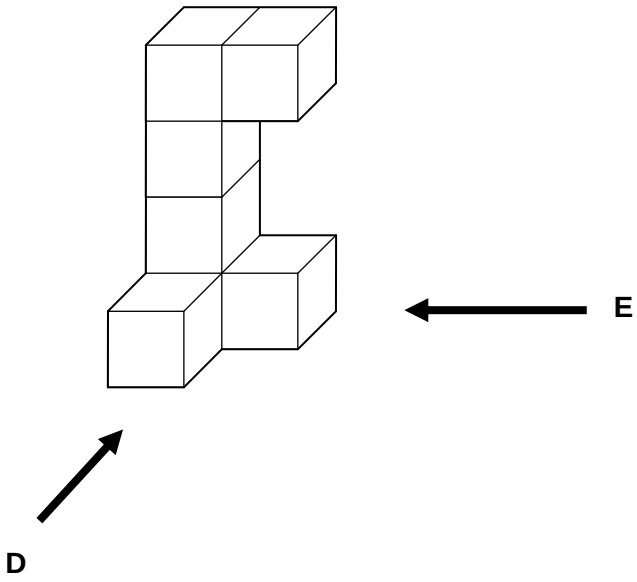
(ii) _____ **[2]**

7

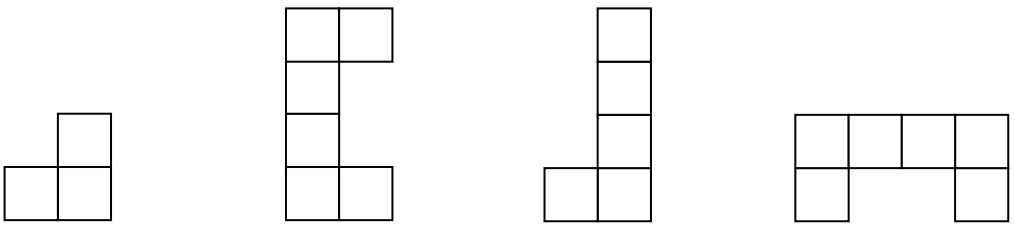
Shape P



Shape Q



Match the arrows with the views shown below.
Write the correct letter underneath each view.



_____ _____ _____ _____ **[4]**

8 Use your calculator to work these out.

(a) $\dfrac{8{\cdot}7+3{\cdot}9}{2{\cdot}1\times 5{\cdot}4}$

(a) _____ **[2]**

(b) $\dfrac{4}{5}-\dfrac{3}{7}$

(b) _____ **[1]**

(c) $\sqrt{6{\cdot}3^2+5{\cdot}2^2}$

(c) _____ **[2]**

9 The timetable below shows the times of boat trips run from the Pier Head during one day.

The boat takes passengers on round trips, starting and finishing at the Pier Head with stops at Seacome and Woodside.

Pier Head (Depart)	Seacome (Arrive/Depart)	Woodside (Arrive/Depart)	Pier Head (Arrive)
10.00 am	10.30 am	10.40 am	10.50 am
11.00 am	11.30 am	11.40 am	11.50 am
12.00 pm	12.30 pm	12.40 pm	12.50 pm
1.00 pm	1.30 pm	1.40 pm	1.50 pm
2.00 pm	2.30 pm	2.40 pm	2.50 pm
3.00 pm	3.30 pm	3.40 pm	3.50 pm

(a) (i) At what time does the second boat of the day leave the Pier Head?

(a)(i) _____ **[1]**

(ii) How long does each round trip from the Pier Head last?

(ii) _____ minutes **[1]**

(b) Rasheed catches the 10.00 am boat from the Pier Head to Seacome.
He needs to be back at the Pier Head by 3.00 pm.

What is the longest time Rasheed could spend in Seacome?

(b) _____ **[2]**

10 Pam gives her cat $\frac{2}{3}$ of a tin of cat food at each meal.
The cat has 2 meals each day.

How many tins of cat food will Pam need to buy to feed her cat for 7 days?

_____ **[3]**

11 In a school there are 5 House teams, A, B, C, D and E.
In a football competition, each team plays every other team once.

(a) Complete the table to show all the games to be played.
The game when B plays D has been entered for you.

	A	B	C	D	E
A					
B				B,D	
C					
D					
E					

[2]

(b) Explain why parts of the table are shaded.

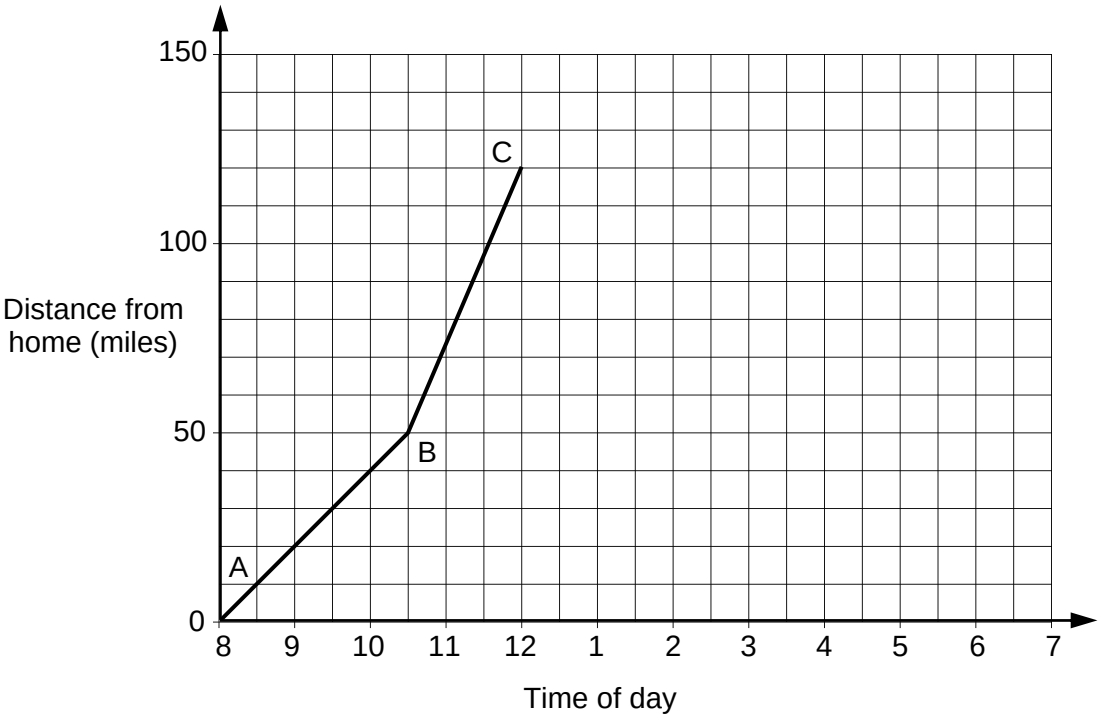
(i) Some parts are shaded  because _____

_____ **[1]**

(ii) Other parts are shaded  because _____

_____ **[1]**

12 The Khan family went on a day trip to a theme park.
The graph represents their car journey to the theme park.



(a) Work out the speed of the car on the section of the journey AB.

(a) _____ mph **[2]**

(b) On which part of the journey was the car travelling faster?
How can you tell this?

_____ because _____

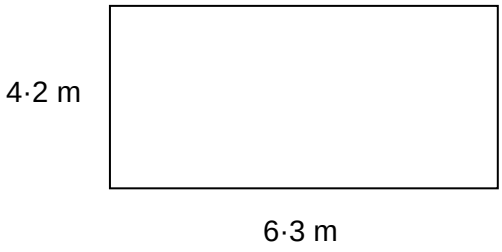
_____ **[1]**

(c) The family stayed at the theme park for 4 hours.
The return car journey took 2 hours.

Complete the graph to show the rest of their day out. **[2]**

13 (a) Calculate the areas of the following shapes.

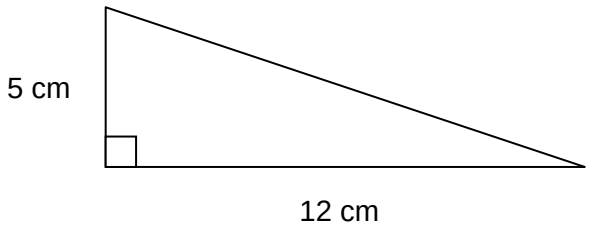
(i)



Not to scale

(a)(i) _____ m² **[2]**

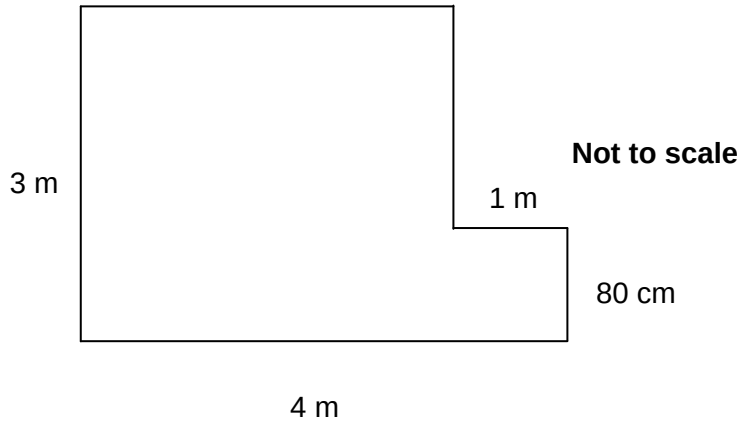
(ii)



Not to scale

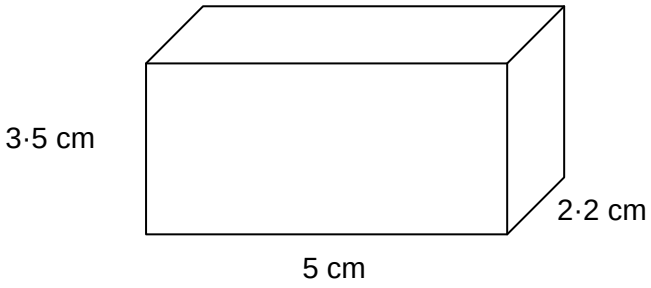
(ii) _____ cm² **[2]**

(iii)



(iii) _____ m² **[3]**

(b) Calculate the volume of this cuboid.
Give the units of your answer.



(b) _____ **[3]**

14 (a) Simplify.

(i) $5x + 3x + 4x$

(a)(i) _____ **[1]**

(ii) $4x + 3y - 5x + 2y$

(ii) _____ **[2]**

(b) Multiply out.

$4(5a + 2)$

(b) _____ **[1]**

(c) Factorise.

$6x - 9xy$

(c) _____ **[2]**

15 Tina and Ifelayo wish to hire a minibus.
They check the rates of two minibus hire companies.

Smoothstyle buses
£75 hire fee
+ 50p per mile

Econospeed buses
£50 hire fee
+ 60p per mile

The total cost of the hire will depend on the mileage.

(a) For a trip of 50 miles, calculate the hire cost for

(i) Smoothstyle buses,

(a)(i) £ _____ **[1]**

(ii) Econospeed buses.

(ii) £ _____ **[1]**

(b)* Tina and Ifelayo think they will travel between 100 and 350 miles on their trip.
They wish to use the company that will give them the better value for money.

Write a short report comparing the two companies.
You may use this graph paper if you wish to.

Report: _____

_____

_____

_____

_____

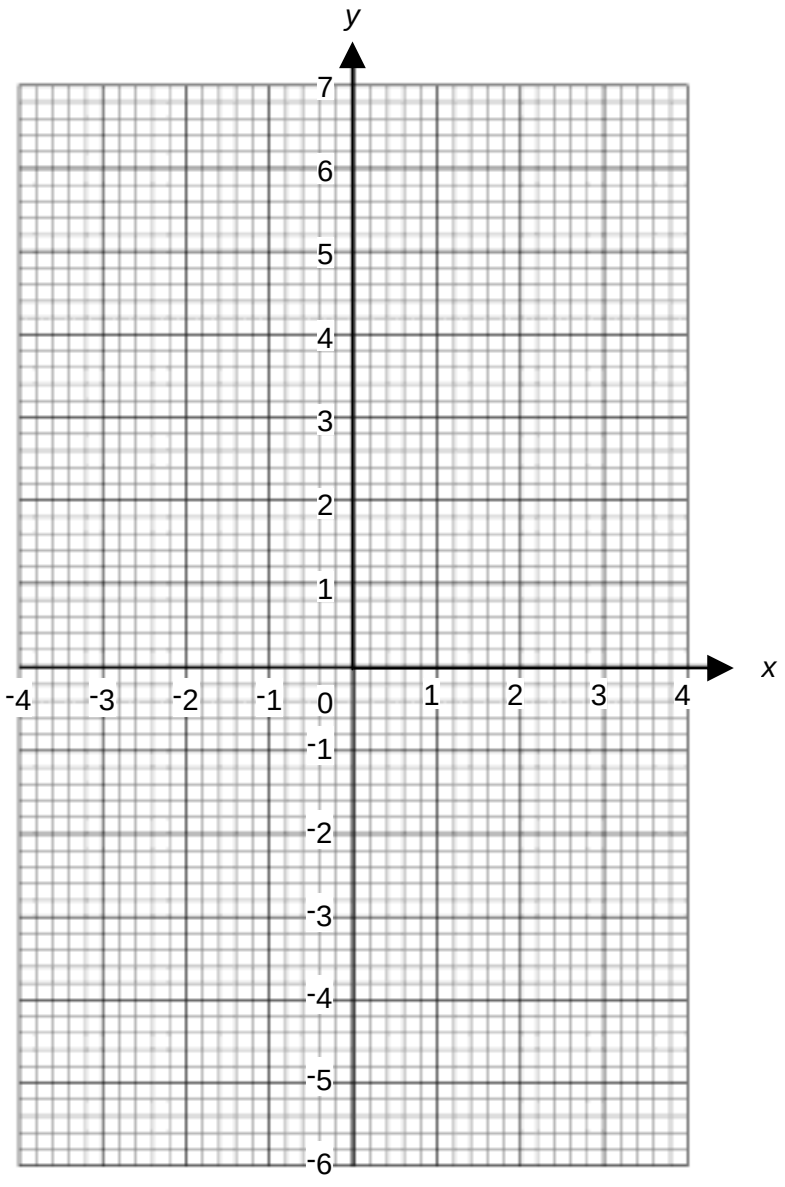
_____ **[6]**

16 (a) Complete the table of values for $y = x^2 - 2$.

x	-3	-2	-1	0	1	2	3
y	7		-1	-2	-1	2	

[1]

(b) On the grid, draw the graph of $y = x^2 - 2$ for values of x from -3 to 3.



[2]

(c) Use your graph to solve the equation $x^2 - 2 = 1$.

(c) _____ and _____ **[1]**

17 (a) Michael throws a fair normal dice.

What is the probability that he gets a 5?

(a) _____ **[1]**

(b) Michael plays a game with Henna. They take it in turns to throw two dice, one red and one blue, and add the scores on the dice.

Complete the table below to show all of the different totals.

Blue dice	Red dice						
		1	**2**	**3**	**4**	**5**	**6**
	1			4			
	2						
	3		5				
	4						
	5		7				
	6						

[2]

(c) Michael wins if his total is either 7 or 11.
Henna wins if she throws the same number on each dice.

(i) What is the probability that Michael wins?

(c)(i) _____ **[2]**

(ii) What is the probability that Henna wins?

(ii) _____ **[1]**

(d) They play the game 144 times.

How many games would you expect each of them to win?

(d) Michael _____ **[1]**

Henna _____ **[1]**

TURN OVER FOR QUESTION 18

18 Use trial and improvement to find the solution of this equation correct to 1 decimal place.

$$x^3 + 2x^2 = 13$$

Show all your trials and their outcomes.

[4]