

Centre Number						Candidate Number				
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For Examiner's Use	
Examiner's Initials	
Pages	Mark
3	
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TOTAL	



General Certificate of Secondary Education
Foundation Tier
June 2012

Applications of Mathematics (Linked Pair Pilot)

93702F

Unit 2 **Geometry and Measures**

F

Thursday 21 June 2012 9.00 am to 10.30 am

<p>For this paper you must have:</p> <ul style="list-style-type: none"> • a calculator • mathematical instruments. 	
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Time allowed

- 1 hour 30 minutes

Instructions

- Use black ink or black ball-point pen. Draw diagrams in pencil.
- Fill in the boxes at the top of this page.
- Answer **all** questions.
- You must answer the questions in the spaces provided. Do not write outside the box around each page or on blank pages.
- Do all rough work in this book. Cross through any work that you do not want to be marked.
- If your calculator does not have a π button, take the value of π to be 3.14 unless another value is given in the question.

Information

- The marks for questions are shown in brackets.
- The maximum mark for this paper is 80.
- The quality of your written communication is specifically assessed in Questions 6 and 9.
These questions are indicated with an asterisk (*).
- You may ask for more answer paper, graph paper and tracing paper. These must be tagged securely to this answer booklet.
- You are expected to use a calculator where appropriate.

Advice

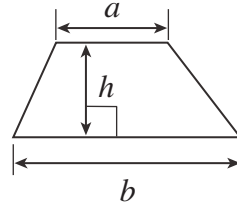
- In all calculations, show clearly how you work out your answer.



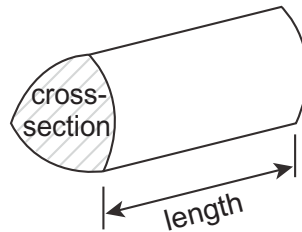
J U N 1 2 9 3 7 0 2 F 0 1

Formulae Sheet: Foundation Tier

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

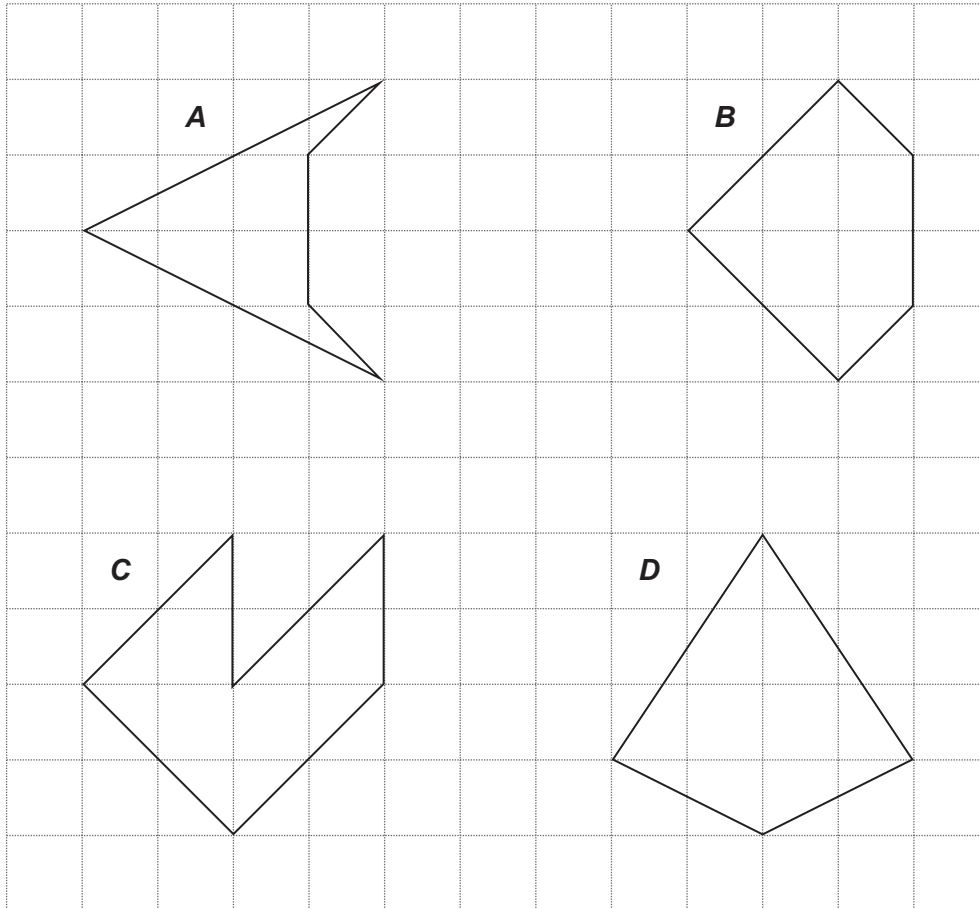


Volume of prism = area of cross-section \times length



Answer **all** questions in the spaces provided.

1 Here are some logos on a square grid.



Mel, Ruby and Steve are choosing a logo for their business.

1 (a) Mel chooses a quadrilateral.
Which logo does she choose?

Answer (1 mark)

1 (b) Ruby chooses a shape that is **not** symmetrical.
Which logo does she choose?

Answer (1 mark)

1 (c) Steve chooses a shape that has exactly three right angles.
Which logo does he choose?

Answer (1 mark)



2 A cleaner works these hours for one week.

	Mon	Tues	Wed	Thu	Fri
6 am to 10 am	✓		✓	✓	
5 pm to 7 pm	✓	✓	✓	✓	✓

2 (a) Work out the total number of hours he works on Monday.

.....

Answer hours (2 marks)

2 (b) Work out the total number of hours he works in the week.

.....

Answer hours (2 marks)

2 (c) He is paid £8.75 an hour.

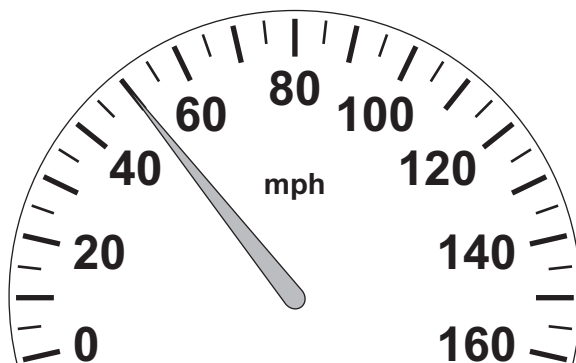
Work out his pay for the week.
 Give your answer to the nearest £10.

.....

Answer £ (3 marks)



3 (a) The speed of a car is shown.



3 (a) (i) What is the speed of the car?

Answer mph (1 mark)

3 (a) (ii) The speed limit is 70 mph.

How much below the limit is the speed of the car?

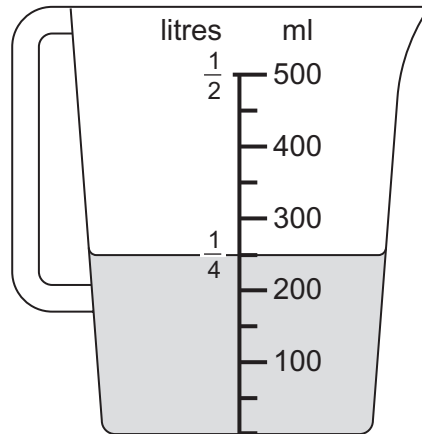
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Answer mph (2 marks)

Question 3 continues on the next page



3 (b) The diagram shows some milk in a jug.



Write down the amount of milk in the jug

3 (b) (i) in litres.

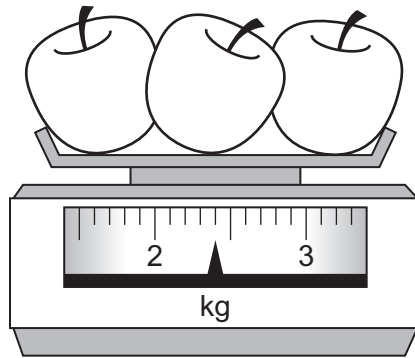
Answer litres (1 mark)

3 (b) (ii) in millilitres.

Answer ml (1 mark)



3 (c) Jo buys these apples.



She pays £3.90

Jo says,
"These apples cost less than £1.50 a kilogram."

Is she correct?
You **must** show your working.

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(3 marks)

Turn over for the next question



4 Here are the ingredients for Honey Lemonade.

For 4 people	
Soda water	2 litres
Lemon juice	500 millilitres
Honey	100 grams

4 (a) Rosie makes Honey Lemonade for 2 people.

How much lemon juice does she need?

.....

Answer ml (1 mark)

4 (b) Kate makes Honey Lemonade for 8 people.
She already has 150 grams of honey.

How much **more** honey does she need?

.....

.....

Answer g (2 marks)

4 (c) Liam makes Honey Lemonade for 36 people.
He buys soda water in 3-litre bottles.

Work out the number of bottles he needs.

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Answer (3 marks)



5 To buy a drink from a machine you need **exactly** £1.20

Pete has three coins.
He has between £1.20 and £2.50
He cannot buy a drink from the machine.

Sue has one coin.
Sue gives her coin to Pete.
Pete can now buy a drink from the machine.

Work out **one** set of coins that Pete and Sue could have.

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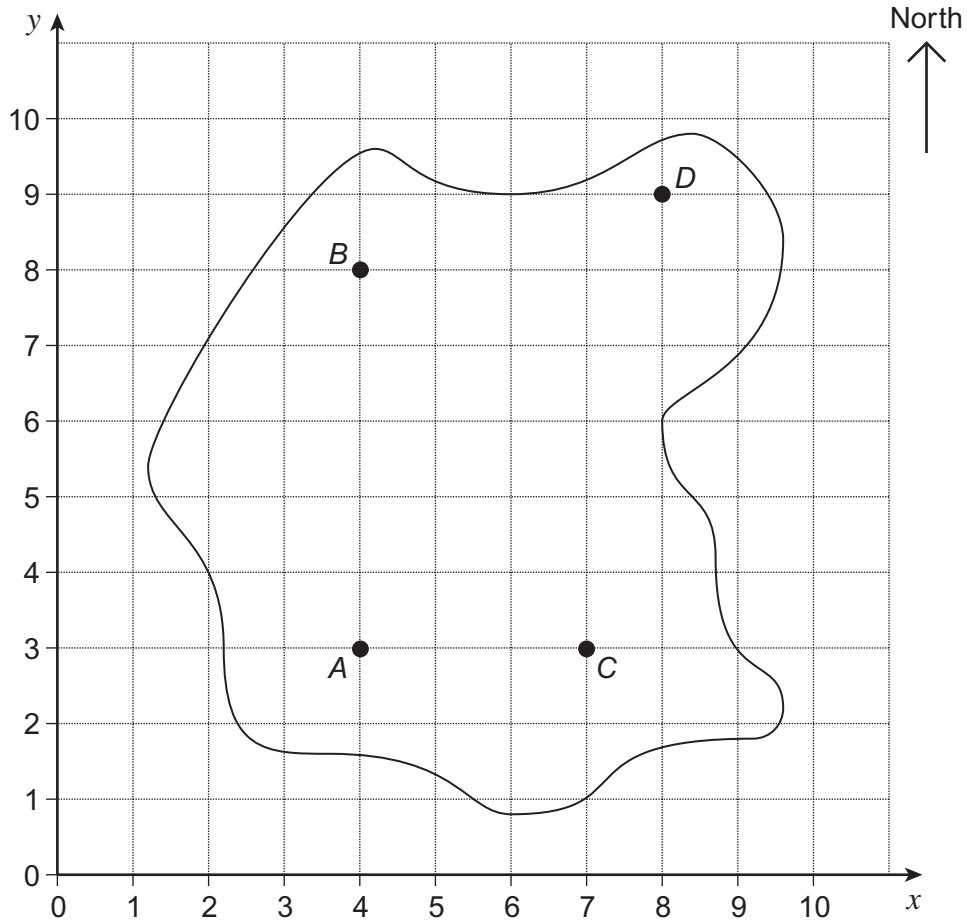
Pete's three coins,,

Sue's coin (3 marks)

Turn over for the next question



*6 A map is drawn to scale on a square grid.



6 (a) Use one of these words to complete each sentence.

North South East West

6 (a) (i) A is due of B. (1 mark)

6 (a) (ii) C is due of A. (1 mark)

6 (b) What is the 3-figure bearing of D from A?

Answer ° (1 mark)



6 (c) Write down the coordinates of *A*.

Answer (..... ,) (1 mark)

6 (d) The distance between *A* and *C* is 12 miles.

Work out the distance between *A* and *B*.

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Answer miles (2 marks)

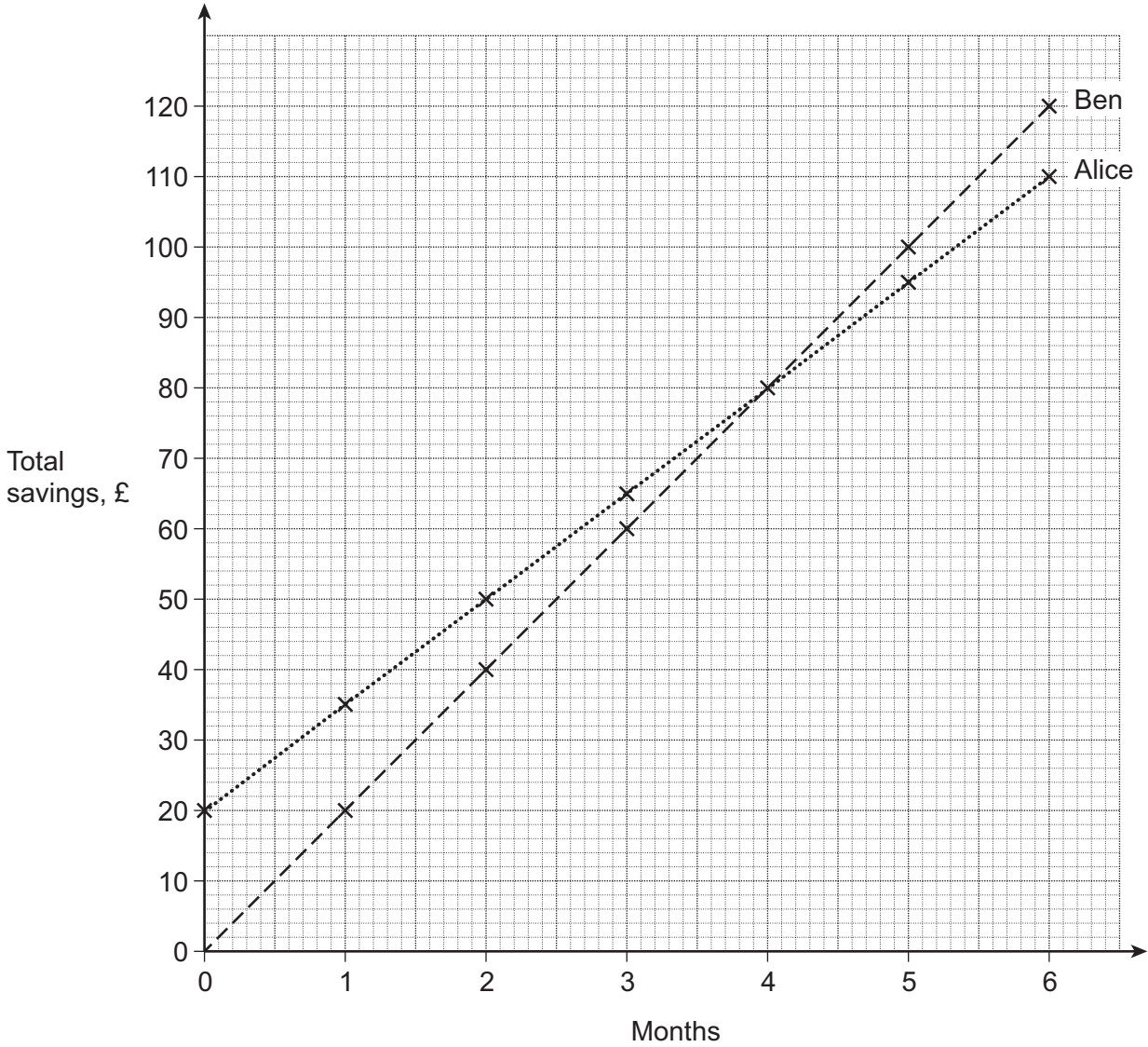
Turn over for the next question



7 Alice has savings of £20.
She adds £15 to her savings each month.

Ben has no savings.
He starts saving a fixed amount each month.

Graphs of their total savings, in £, during the next six months are shown.



7 (a) After 5 months, what are Ben's total savings?

Answer £ (1 mark)

7 (b) How much does Ben add to his savings each month?

.....
Answer £ (1 mark)

7 (c) After how many months are Alice's total savings £65?

Answer months (1 mark)

7 (d) Who will have total savings of £200 first?
Give a reason for your answer.

Person

Reason
.....
(2 marks)

Turn over for the next question

5

Turn over ►



8 Rob and Kim want to raise money for a charity.
They plan to sell tickets numbered from 1 to 100.

Rob says,
"I want to give all the multiples of 10 a prize."

Kim says,
"I want to give all the factors of 100 a prize."

Who wants to give more prizes?
Show how you decide.

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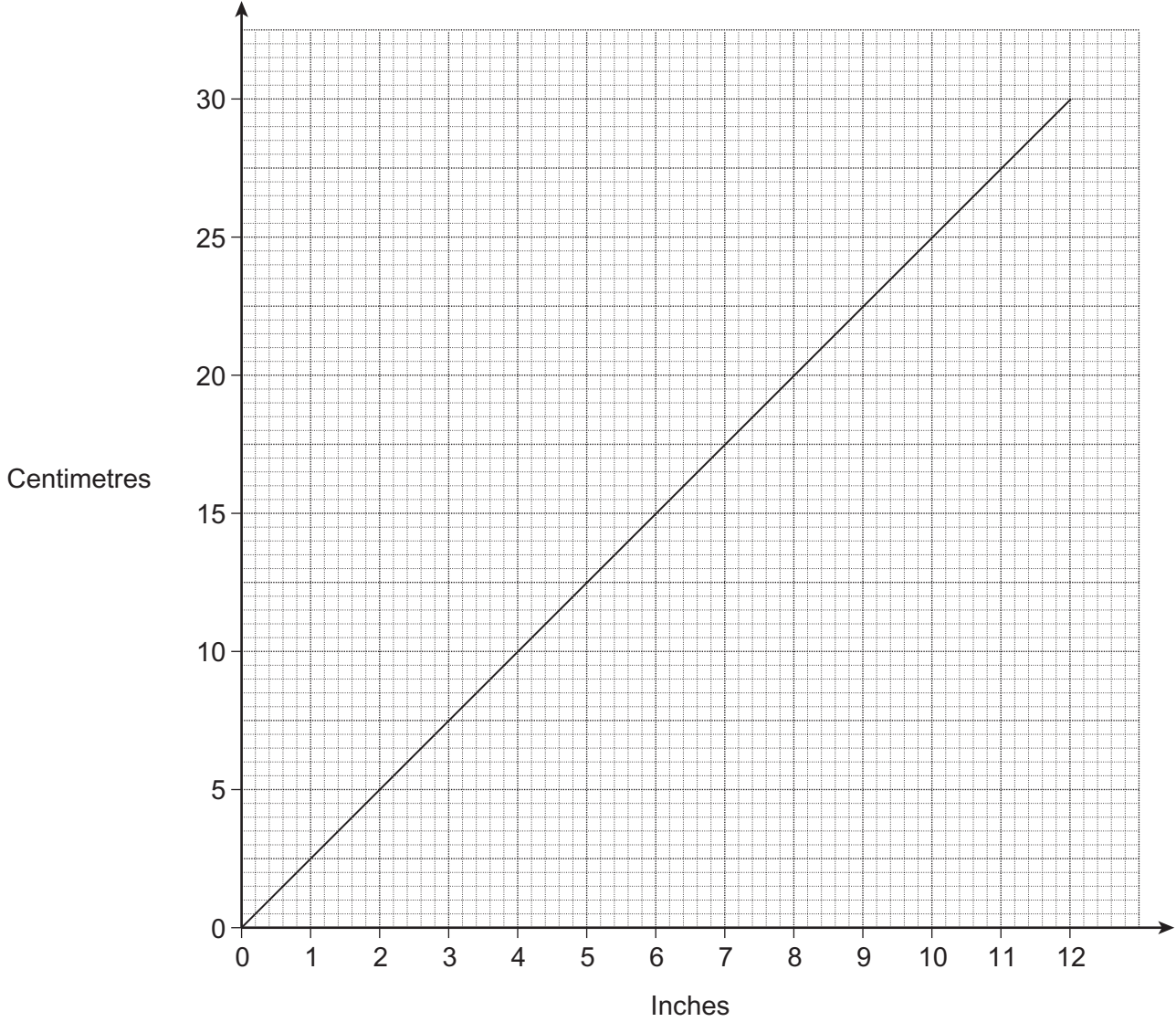
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Answer (4 marks)



*9

Here is a conversion graph.



Simon is 160 centimetres tall.
Tina is 5 feet 6 inches tall.

1 foot = 12 inches

Who is taller?
You **must** show your working.

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Answer

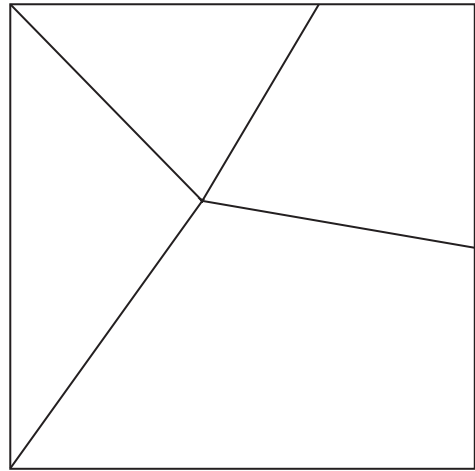
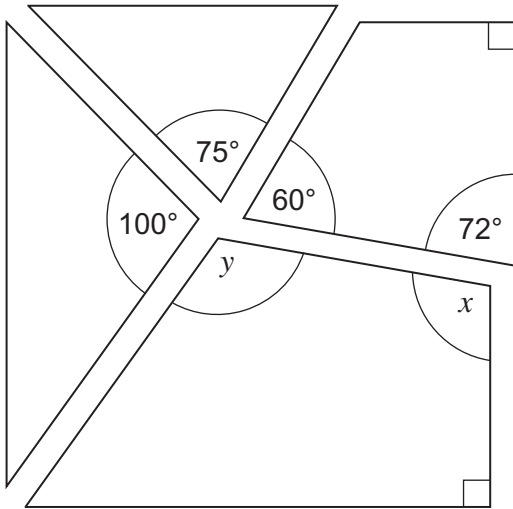
(5 marks)

9

Turn over ►



10 Four paving slabs are put together to make a square as shown.



Not drawn accurately

10 (a) (i) Work out the value of the angle marked x .

.....

Answer degrees (2 marks)

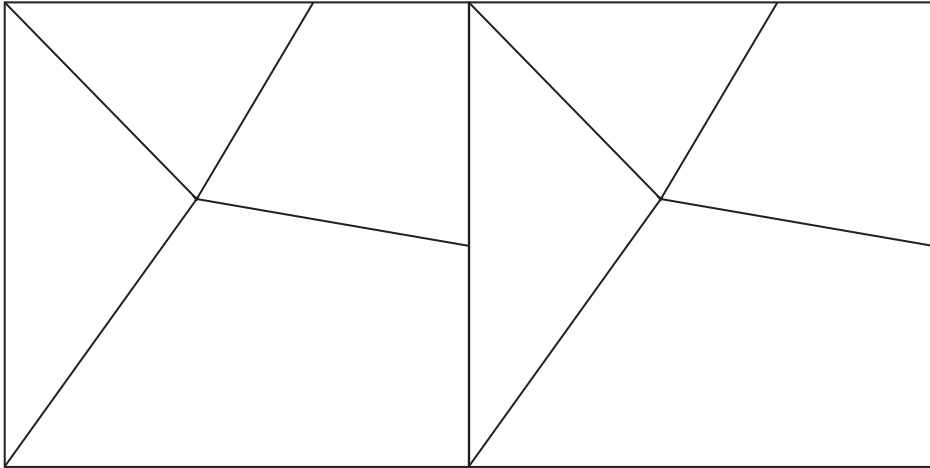
10 (a) (ii) Work out the value of the angle marked y .

.....

Answer degrees (2 marks)



10 (b) Two of the squares make this rectangle.



Not drawn
accurately

The perimeter of the rectangle is 420 cm.

Work out the area of the rectangle.

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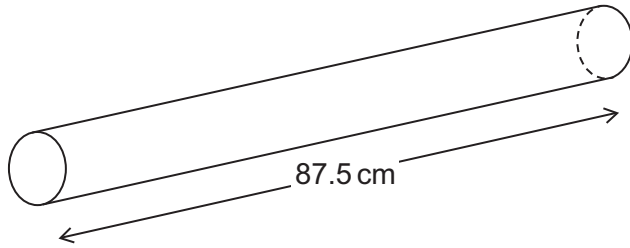
Answer cm² (4 marks)

Turn over for the next question

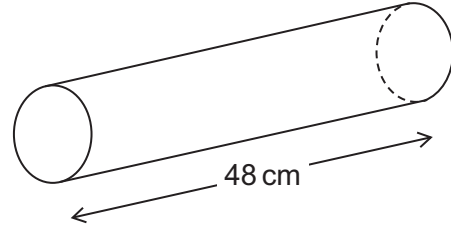


11 Here are two cylindrical tubes.

Tube A
diameter 5 cm



Tube B
diameter 7.6 cm



11 (a) Here is a rule for posting tubes.

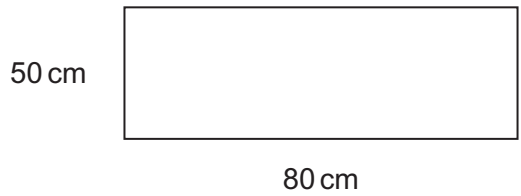
The length added to twice the diameter must be no more than 1040 mm.

Show that **Tube A** can be posted.

.....

(2 marks)

11 (b) A designer makes rectangular posters measuring 80 cm by 50 cm.



Not drawn accurately

The posters are rolled up and placed in tubes.

11 (b) (i) Will a rolled up poster fit in **Tube A**?
Give a reason for your answer.

.....

(1 mark)

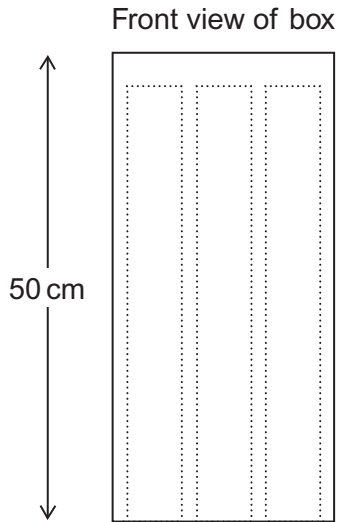
11 (b) (ii) Will a rolled up poster fit in **Tube B**?
Give a reason for your answer.

.....

(1 mark)



11 (c) Three of **Tube B** are packed in a box of height 50 cm.



Plan view of box



Not drawn accurately

There is a 0.5 cm gap between the tubes.
There is a 0.5 cm gap between the tubes and the sides of the box.

Work out the volume of the box.

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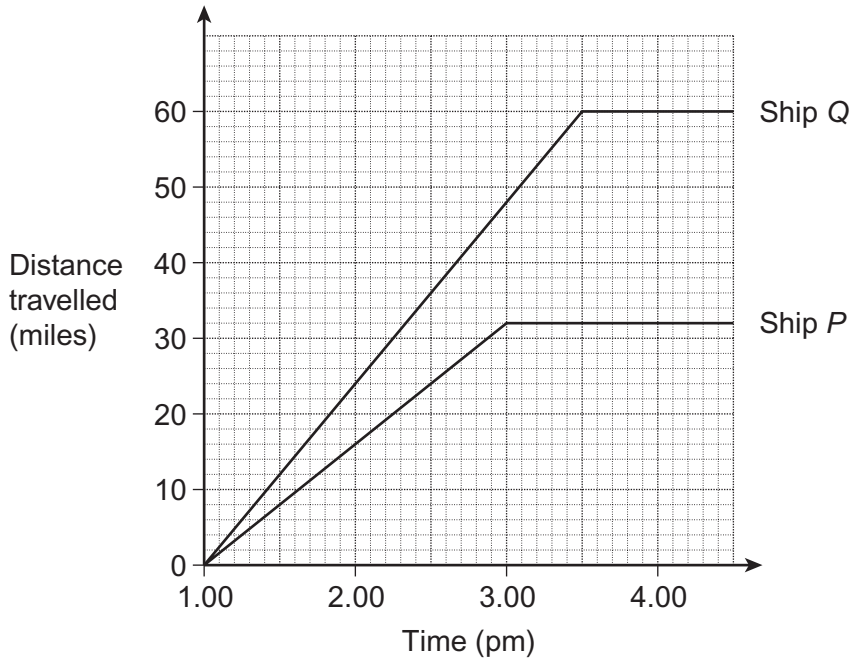
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Answer cm³ (4 marks)



12 The distance-time graphs show the journeys of two ships, *P* and *Q*. Both ships start their journeys at 1.00 pm.



12 (a) What distance does Ship *P* travel?

.....

Answer miles (1 mark)

12 (b) Ship *P* stops earlier than Ship *Q*.

How many minutes earlier?

.....

Answer minutes (1 mark)

12 (c) Which ship travels faster?
Work out how many miles per hour faster.

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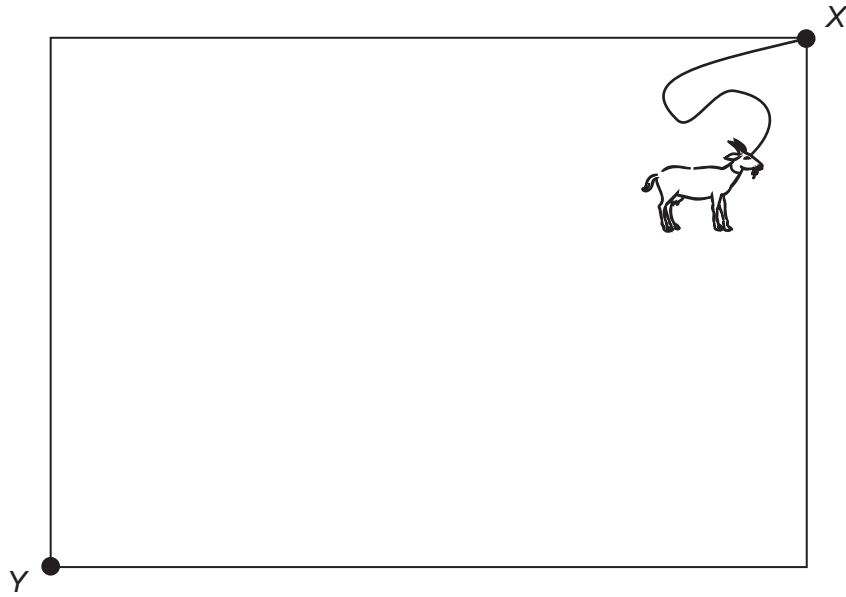
Ship travels miles per hour faster (2 marks)



13

A scale diagram of a rectangular field is shown.

Scale : 1 centimetre represents 2 metres



13 (a)

A goat is tied to a post at X by a rope. The goat can reach 8 metres from X.

Draw accurately on the scale diagram to show the area of the field the goat can reach.

(2 marks)

13 (b)

A horse is tied to a post at Y by a different rope. The areas of the field the horse and goat can reach do **not** overlap.

What is the longest possible length of this rope?

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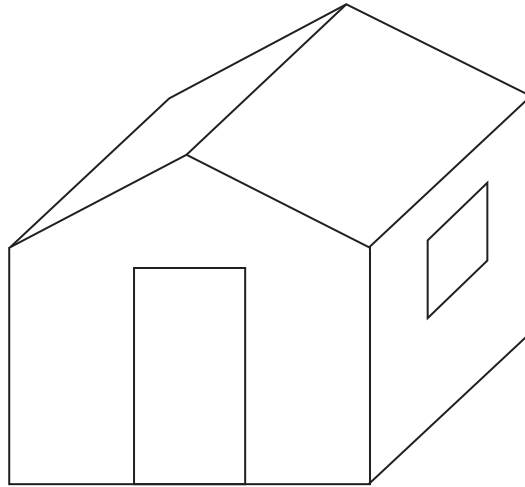
Answer metres (2 marks)

8

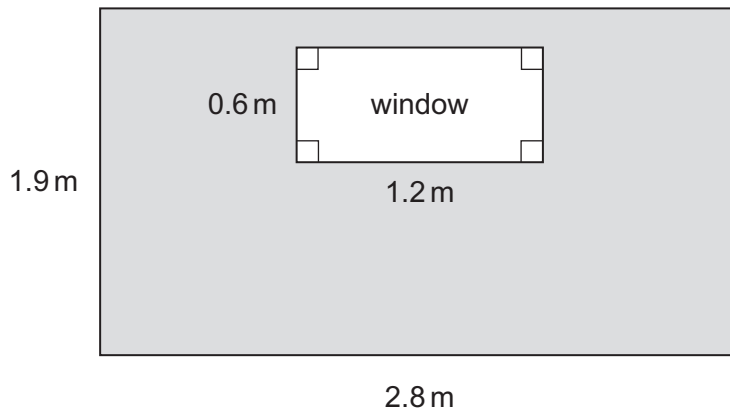
Turn over ►



- 14** A wooden shed is in the shape of a prism.
Both rectangular walls have identical glass windows.



- 14 (a)** One rectangular wall is shown.



Not drawn
accurately

- 14 (a) (i)** Work out the area of the window.

.....

Answer m² (1 mark)

- 14 (a) (ii)** Work out the area of wood in the wall.
This area is shaded on the diagram.

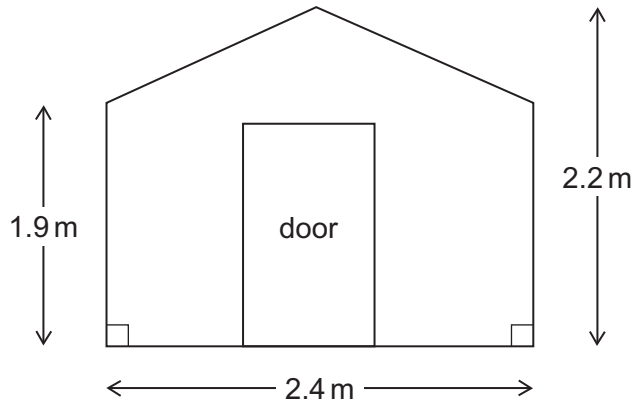
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Answer m² (2 marks)



14 (b) Here is a diagram of the front wall and door. The diagram is symmetrical.



Not drawn accurately

Show that the total area of the front wall and door is 4.92 m².

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(2 marks)

14 (c) The wood on the outside surfaces of the four walls and the door is painted.

Each surface needs **two** coats of paint.
One litre of paint covers 5 m².

How many litres of paint are needed?
You **must** show your working.

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Answer litres (4 marks)

END OF QUESTIONS



There are no questions printed on this page

**DO NOT WRITE ON THIS PAGE
ANSWER IN THE SPACES PROVIDED**

