

Surname	Centre Number	Candidate Number
Other Names		0



GCSE LINKED PAIR PILOT

4361/01

APPLICATIONS OF MATHEMATICS

UNIT 1: Applications 1

FOUNDATION TIER

A.M. FRIDAY, 13 June 2014

1 hour 30 minutes

Suitable for Modified Language Candidates

ADDITIONAL MATERIALS

A calculator will be required for this paper.

INSTRUCTIONS TO CANDIDATES

Use black ink or black ball-point pen.

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.

Take π as 3.14 or use the π 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.

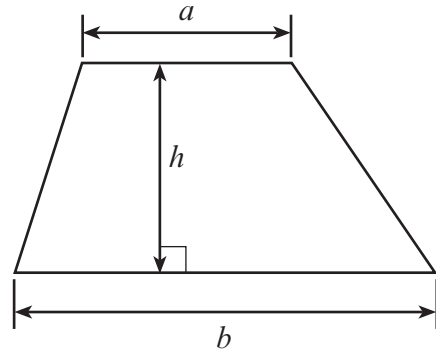
The number of marks is given in brackets at the end of each question or part-question.

You are reminded that assessment will take into account the quality of written communication (including mathematical communication) used in your answer to question 4(a).

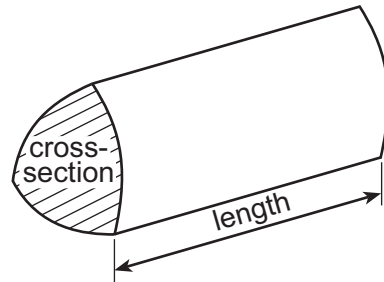
For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1.	12	
2.	7	
3.	9	
4.(a)	10	
4.(b)(c)	7	
5.	7	
6.	5	
7.	4	
8.	4	
9.	7	
10.	8	
Total	80	

Formula List

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



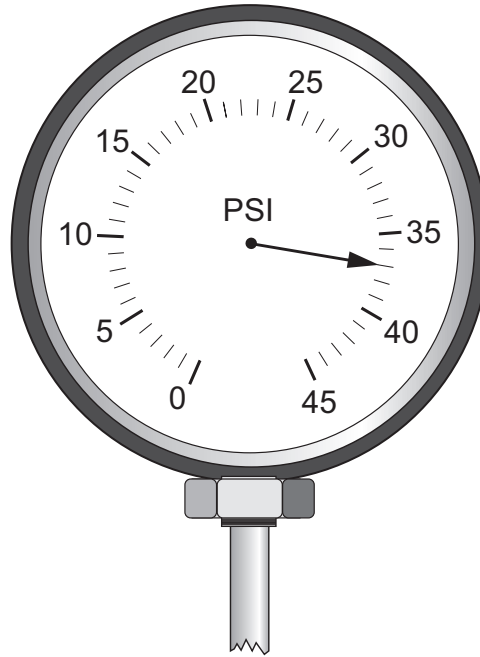
Volume of prism = area of cross-section \times length



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1. (a) Tyre pressure is measured in PSI (pounds per square inch).
The pump in the diagram shows the pressure in a tyre of a bicycle.
What is the pressure in the tyre?

[1]



Pressure in the tyre is PSI

(b) The sketch below represents part of a cycle route.

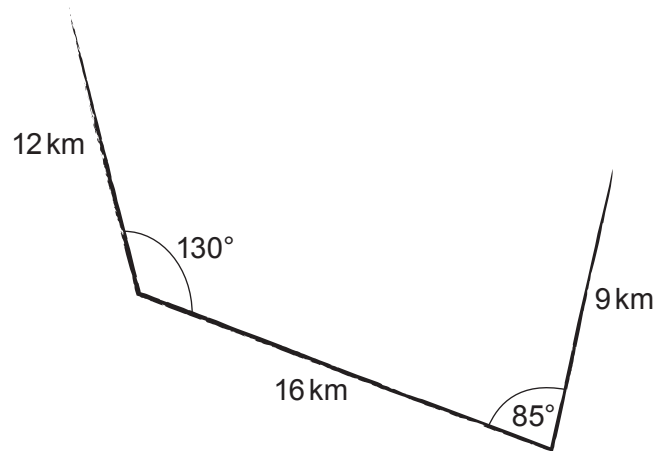




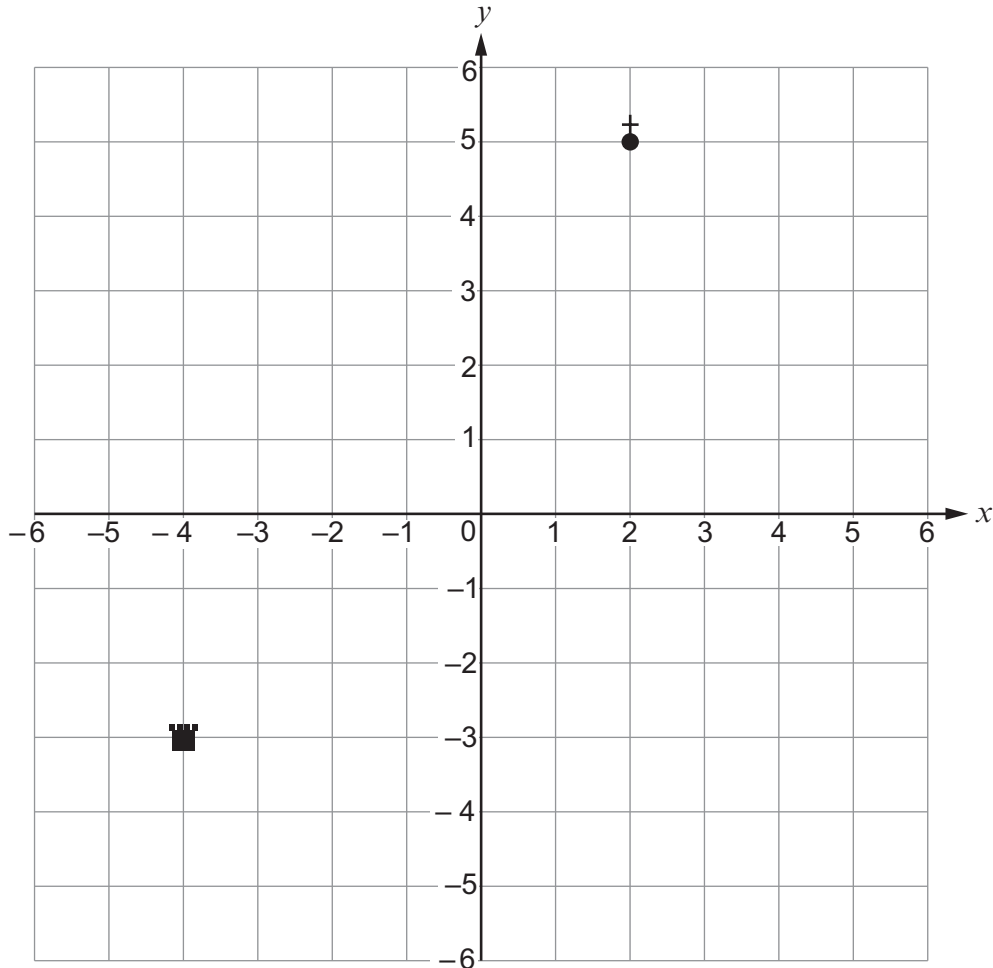
Diagram not drawn to scale

Draw an accurate diagram for the part of the cycle route shown.
Use a scale of 1 cm to represent 2 km.
The line representing the 16 km has already been drawn for you.

[4]

- (c) Several places can be seen from the cycle route.

A church  and castle  are shown on the grid below.



- (i) What are the coordinates of the church and castle shown on the grid? [2]

The coordinates of the church are (..... ,)

The coordinates of the castle are (..... ,)

- (ii) A skating park can also be seen from the cycle route.
The coordinates of the skating park are (3, 0).
Plot this point on the grid above and label the point S.

[1]

(d) The average times to cycle between these places are given in the table below.

	Church	Castle	Skating park
Church		1.5 hours	20 minutes
Castle	1.5 hours		$\frac{3}{4}$ hour
Skating park	20 minutes	$\frac{3}{4}$ hour	

Use the times given above to answer the following.

- (i) How long does it take to cycle from the castle to the skating park?
Give your answer in minutes.

[1]

.....

.....

..... minutes

- (ii) How long, **in total**, will it take to cycle
- from the castle to the skating park
 - then from the skating park to the church
 - and finally from the church back to the castle?

[3]

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2.



Christopher is tiling his kitchen walls.

- (a) He needs 25 boxes of tiles.
The price of one box is £27.60.
The tile shop has a special offer of

Buy one box and get another box half price

Christopher makes use of this special offer.
How much does Christopher pay for the 25 boxes of tiles?

[5]

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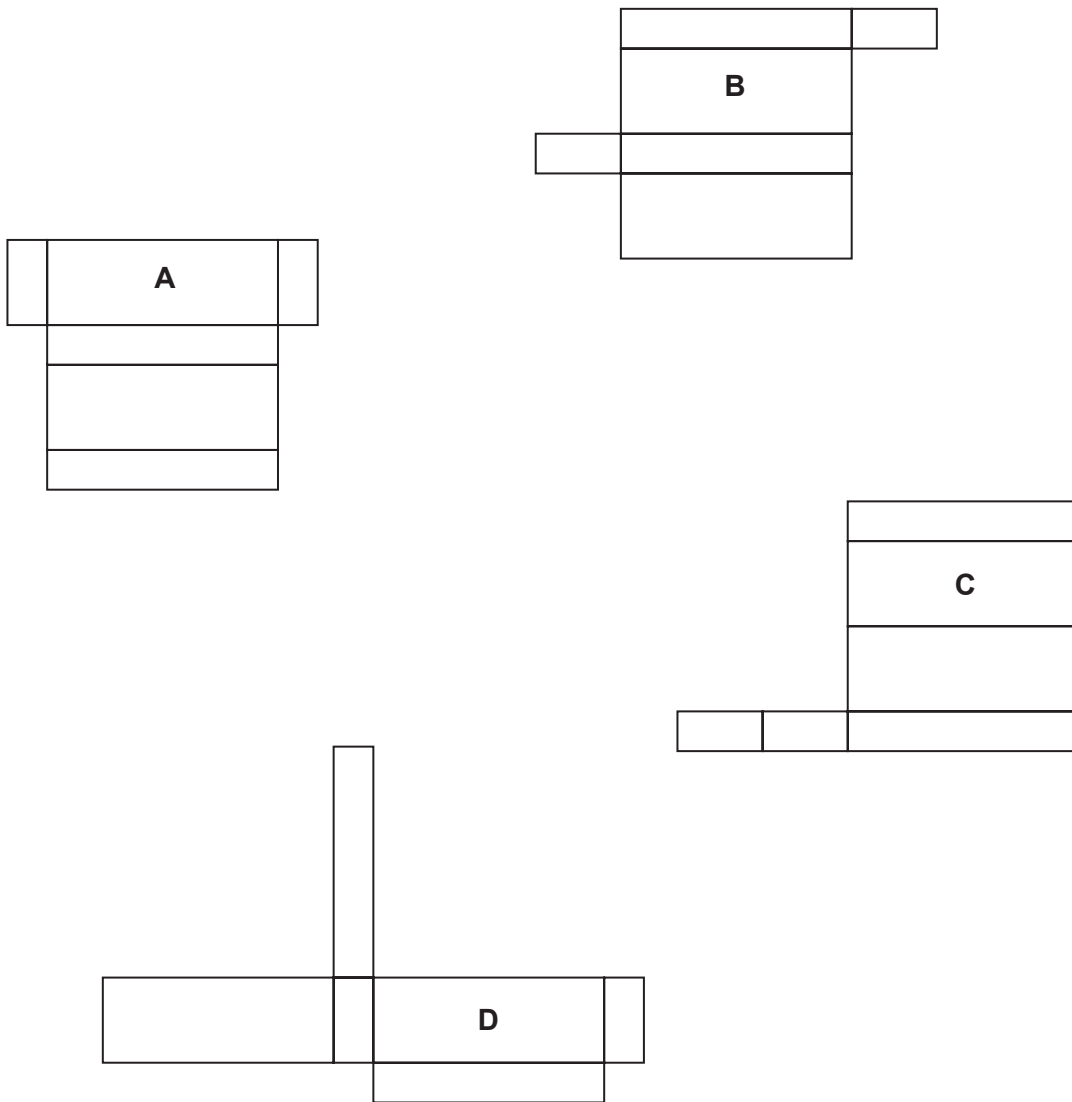
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- (b) The boxes that contain the tiles are cuboids.
 Circle the possible **nets** that could be used to make the boxes for the tiles.

[2]



3. The following 7 numbers are how many minutes people had to wait in a restaurant for their meal.

17 24 19 30 19 25 20

(a) Find the mean, median, mode and range of the 7 waiting times. [7]

Mean

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Median

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Mode

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Range

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(b) Jimmy recorded an extra waiting time at the restaurant.
This made the range of the 8 waiting times equal to the mode of the 8 waiting times.
Find a possible value for this extra waiting time. [2]

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- (b) The dance floor was in the shape of a rectangle, as shown below.

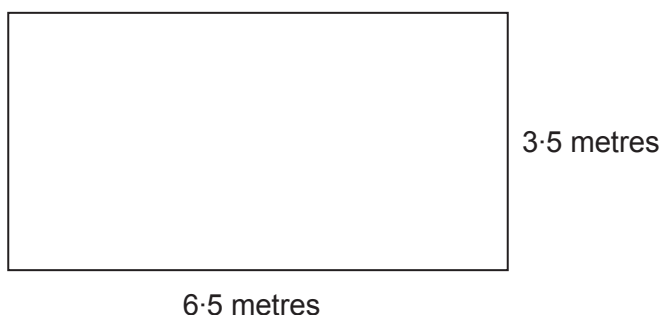


Diagram not drawn to scale

Calculate the area of the dance floor. Give the units of your answer.

[3]

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- (c) The cost of hiring a limousine for the party is calculated using

**£295
plus
£2.80 per mile**

- (i) Calculate the cost of hiring a limousine for travelling a distance of 20 miles.

[2]

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- (ii) Write a formula for the cost of hiring a limousine.
Use C for the cost, in pounds, and m for the distance, in miles.

[2]

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5. A new logo for a sports club has been designed to go onto their kit. The design consists of **two squares** joined to an **equilateral triangle** as shown below.

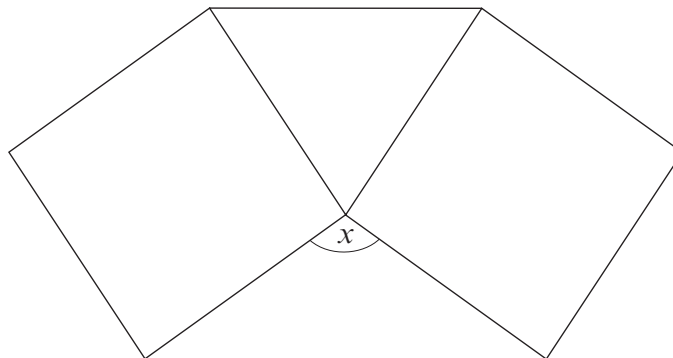


Diagram not drawn to scale

- (a) Each square has sides of length 27 mm.
Find the perimeter of the logo. **Give your answer in cm.**

[4]

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- (b) Find the size of angle x .

[3]

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6. (a) Red and green buoys (floating markers) are used to help boats find their way at sea. They often have flashing lights placed on them. When he is sailing, Dewi notices that the light on a green buoy (floating marker) flashes every 8 seconds and the light on a red buoy (floating marker) flashes every 6 seconds. Dewi sees them flash at the same time. How many seconds later will he see the lights flash together again? [2]

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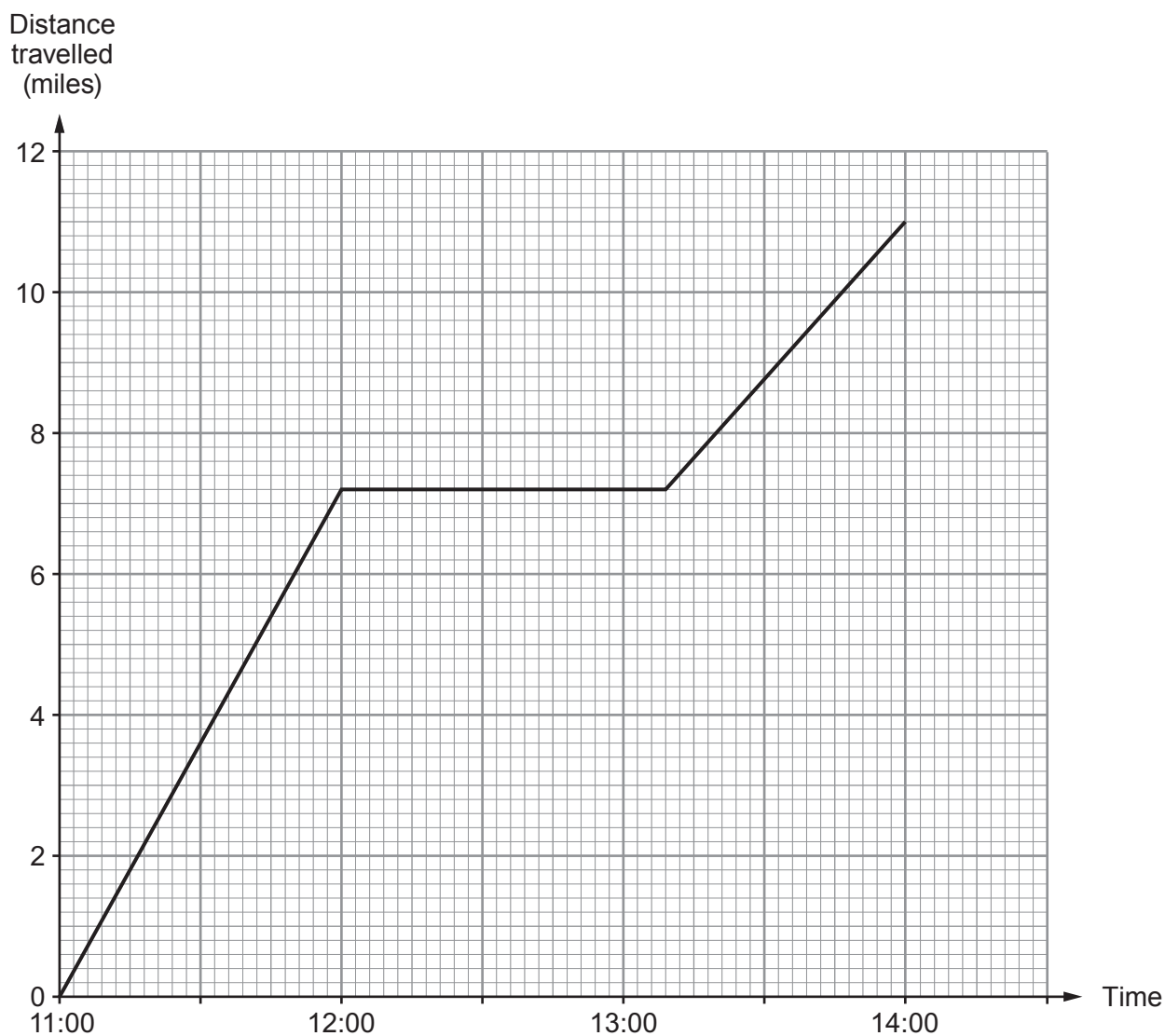
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(b) The travel graph below represents Dewi's journey when he is sailing.



(i) How far did he travel in the first half hour? [1]

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(ii) Dewi stops for lunch and drops the anchor to stop his boat from drifting. For how many minutes did he stop? [1]

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(iii) Do not do any calculations. Decide whether Dewi is travelling faster before or after his stop. You must give a reason for your answer. [1]

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7. A survey is done to find out which age groups buy books the most or least.
The survey is carried out by asking people questions as they come out of a book shop.
Two questions from the survey questionnaire are shown below.

1. How old are you? Put a tick in the box.	under 20	<input type="checkbox"/>
	20 to 30	<input type="checkbox"/>
	30 to 40	<input type="checkbox"/>
	older than 40	<input type="checkbox"/>
2. Do you buy books? Put a tick in the box.	Yes	<input type="checkbox"/>
	No	<input type="checkbox"/>

- (a) Explain why this may be a biased survey. [1]

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- (b) Give a criticism about the design of question 1 in the survey. [1]

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- (c) You want to find out how much people will pay for a paperback book. Write a question with a selection of answer boxes. [2]

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8. Bikes are built around a frame.



Below is a scale drawing of a bike frame.

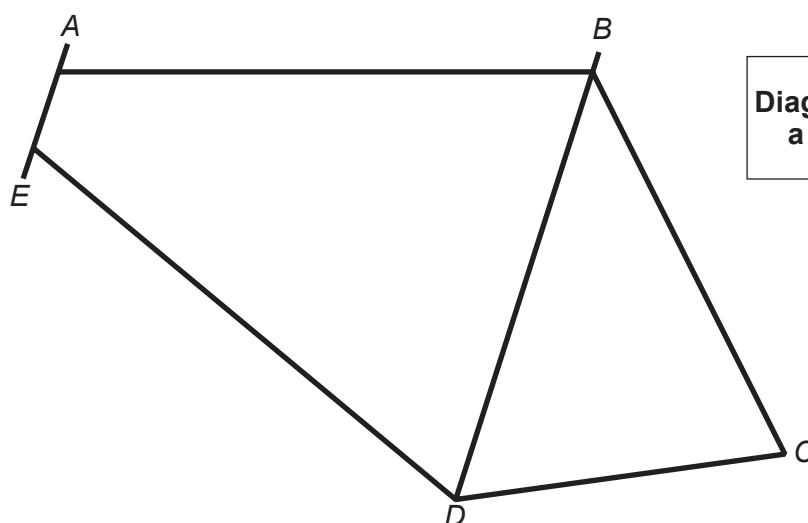


Diagram drawn to
a scale of 1:8

- (a) Write down an approximate length of the cross bar AB .
Give your answer in **metres**.

[2]

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- (b) Is AE parallel to BD ?
Use angle facts to give a reason for your answer.

[2]

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10. Lizzie's job is to calculate solutions for a data analysis company which involves working with algebraic equations and expressions.

Process the following for Lizzie.

- (a) Factorise $35x + 15$. [1]

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- (b) Simplify $3a + 5b - 19a - 16b$. [1]

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- (c) Simplify $3(3d - 2e) - (d - e)$. [2]

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- (d) Lizzie knows that a solution to the equation $x^3 - 2x - 40 = 0$ lies between 3 and 4. Find this solution correct to one decimal place. [4]

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END OF PAPER