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| 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. MONDAY, 16 January 2012

1½ hours

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.

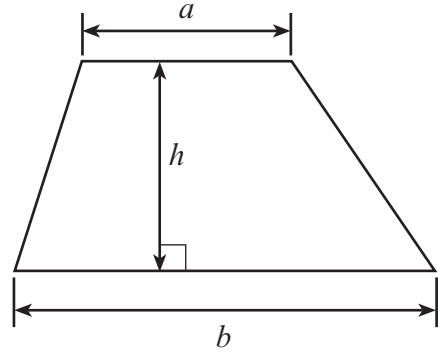
The number of marks is given in brackets at the end of each question or part-question.

You are reminded that assessment will take into account the quality of written communication (including mathematical communication) used in your answer to question 2.

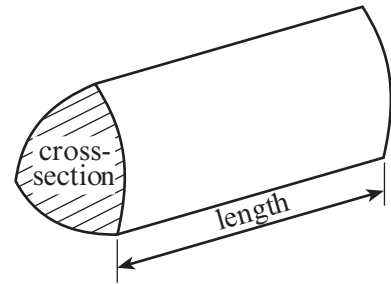
| For Examiner's use only | | |
|-------------------------|--------------|--------------|
| Question | Maximum Mark | Mark Awarded |
| 1 | 3 | |
| 2 | 6 | |
| 3 | 3 | |
| 4 | 8 | |
| 5 | 8 | |
| 6 | 7 | |
| 7 | 3 | |
| 8 | 4 | |
| 9 | 4 | |
| 10 | 3 | |
| 11 | 9 | |
| 12 | 4 | |
| 13 | 4 | |
| 14 | 7 | |
| 15 | 3 | |
| 16 | 4 | |
| TOTAL MARK | | |

Formula List

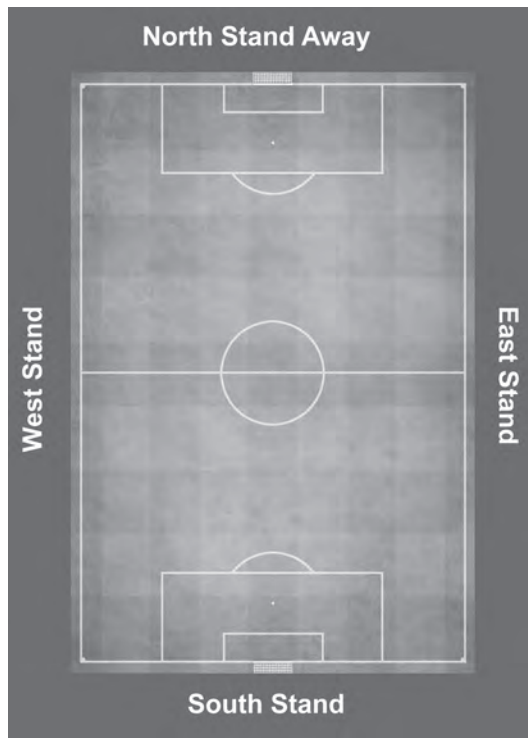
Area of trapezium = $\frac{1}{2}(a + b)h$



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



- 1. The diagram shows the ground layout of a football stadium.



During a recent league game the number of spectators in the

- West Stand was **7319**
- East Stand was **6327**
- South Stand was **4978**.

The North Stand is kept for away team supporters.
All **1093** away supporters were in the North Stand.

Showing **all** your workings, calculate the total attendance, rounding your answer to the nearest 100.

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[3]

- 3. Jeremy and Susie visit a local car racing track. They see three cars being driven on the track. Each car needs to stop at some stage to refuel.



Before stopping to refuel,
the 1st car travels a distance of 192 kilometres at an average speed of 160 kilometres per hour,
the 2nd car travels a distance of 120 kilometres at an average speed of 150 kilometres per hour,
the 3rd car travels a distance of 110 kilometres at an average speed of 125 kilometres per hour.
Using the formula,

$$\text{Time} = \text{Distance} \div \text{Average Speed}$$

find which car travelled for the shortest length of time before having to stop to refuel.

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[3]

4. Leah has received many detentions in school for not completing her homework. The reason why she is receiving detentions is because she spends too much time playing games on her games console. She decides to investigate the amount of time she spends playing games. She records the number of minutes that she spends each day playing games. The following are her results.

| Day | Mon | Tues | Wed | Thurs | Fri | Sat | Sun |
|---------|-----|------|-----|-------|-----|-----|-----|
| Minutes | 68 | 80 | 30 | 68 | 120 | 240 | 185 |

- (a) On which day did Leah spend exactly half an hour playing on her games console?

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[1]

- (b) Find the mean, median, mode and range of the number of minutes spent per day playing games on her games console.

Mean

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Median

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Mode

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Range

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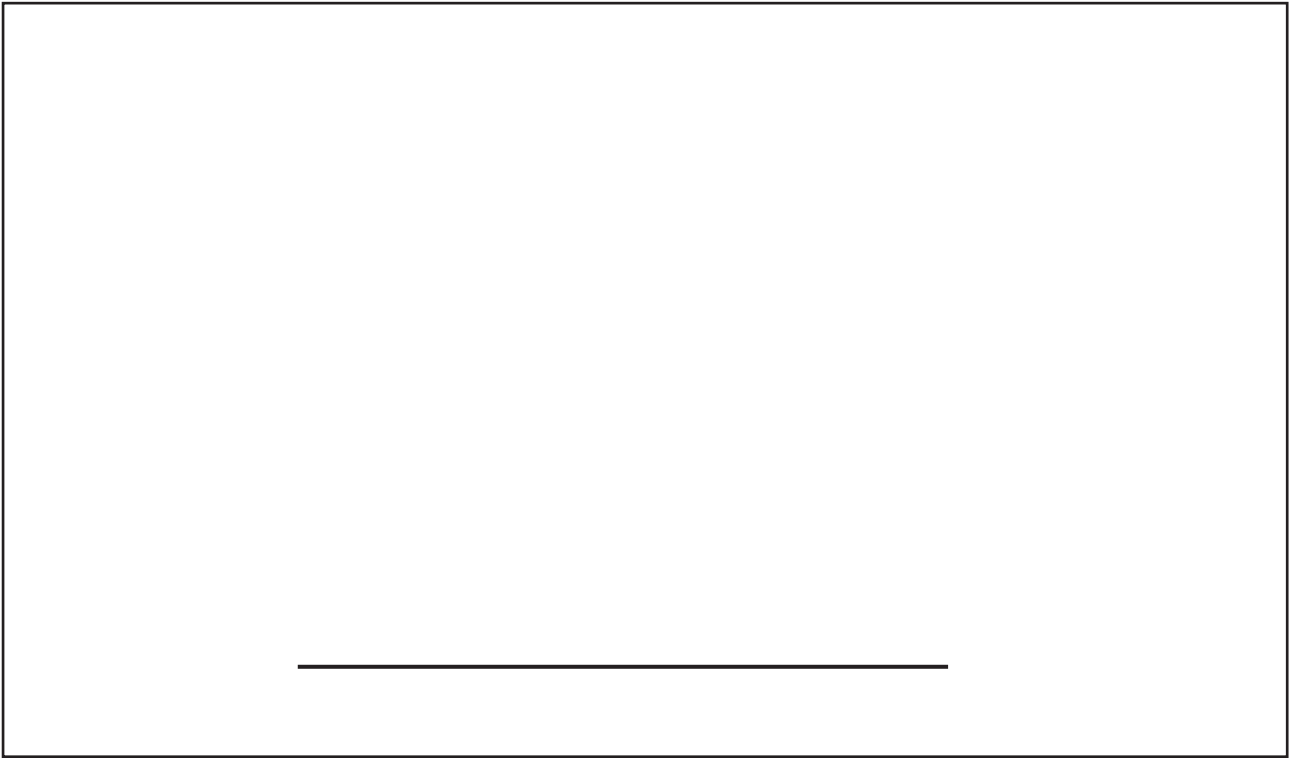
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[7]

5. (a) Accurately draw the outline of a circular place mat for a coffee cup.
The place mat has a diameter of 9 cm.

[2]

- (b) A triangular piece of material needs to be cut out of a rectangular piece of cloth. The line shown is the base of the triangle that needs to be cut out.



- (i) How long is the base of the triangle?

..... [1]

- (ii) The line joining the top of the triangle to the midpoint of the base is perpendicular to the base and is 5.7 cm long.

Mark the position of the top of the triangle on the diagram shown above. [3]

- (c) A local business decides to build a new office.
A sketch of the floor of the building is shown below.

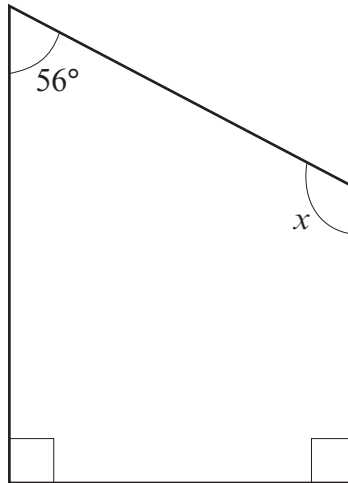


Diagram not drawn to scale

What is the size of the angle marked x ?

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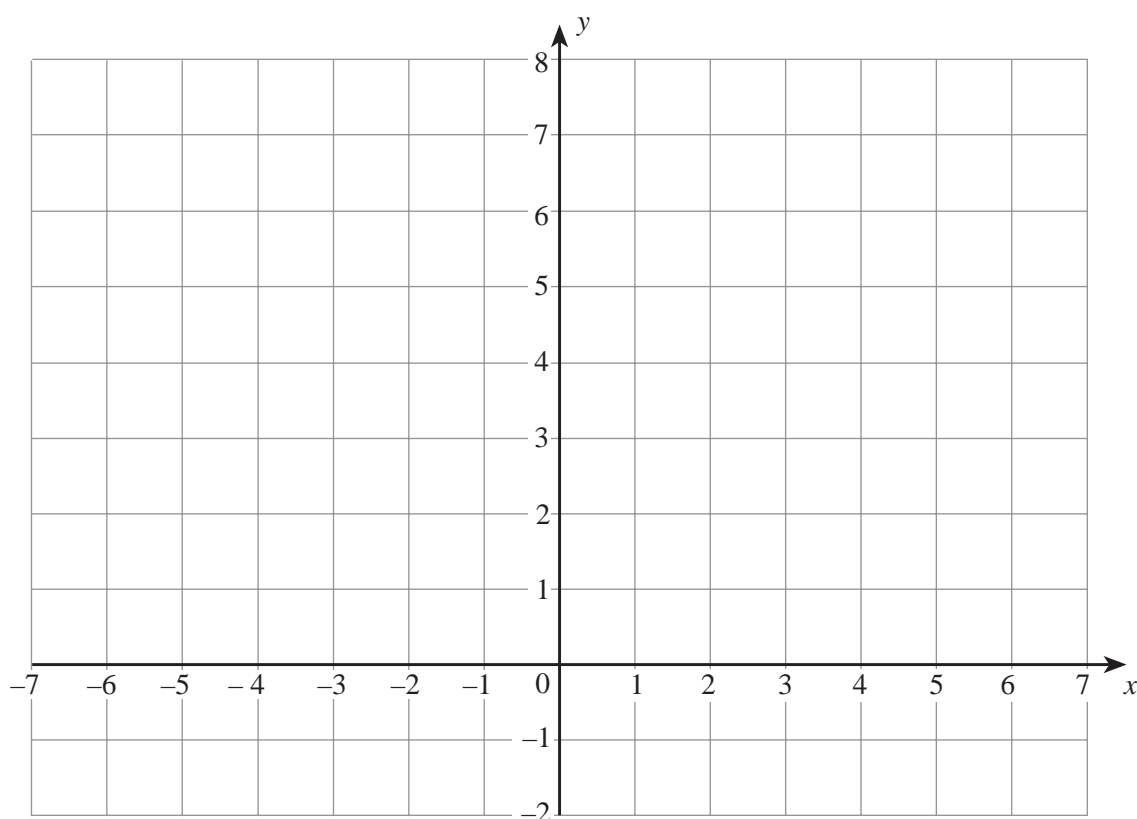
[2]

6. (a) Jane decides to enter a competition held by her school.

The rules of the competition are as follows:

- Plot 4 points on the centimetre-squared grid below to create a rectangle.
- The rectangle must overlap the y -axis.
- The rectangle must have an area which is greater than 31 cm^2 .

Mark a possible position of Jane's rectangle on the grid and write down the coordinates of the 4 vertices (corners) of the rectangle.

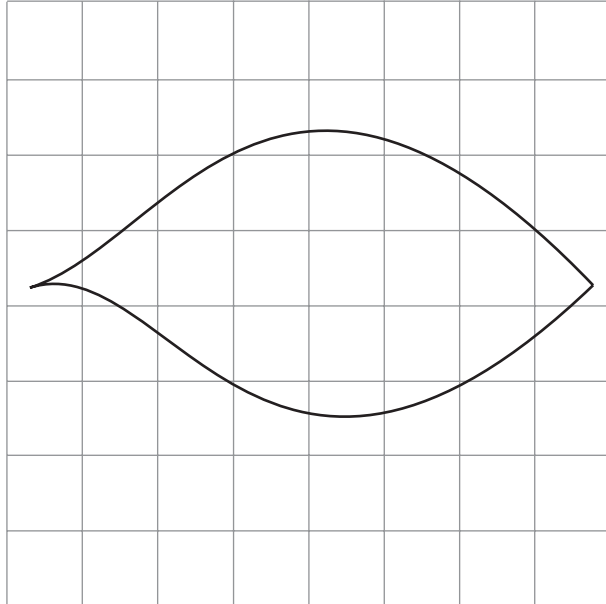


The 4 vertices (corners) have coordinates

(.....,), (.....,), (.....,), (.....,).

[5]

(b) Estimate the area of the leaf shown on the centimetre squared grid.



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Estimate for the area of the leaf = cm² [2]

7. Chloe decided to collect information about what type of footwear her friends like the most. The information she collected is shown below.

| Type of Footwear | Number of people |
|------------------|------------------|
| Boots | 11 |
| Flip-flops | 4 |
| Pumps | 5 |
| Slippers | 12 |
| Trainers | 8 |

- (a) From the information that Chloe collected, what is the modal type of footwear?

..... [1]

- (b) If one of the people that Chloe asked was selected at random, what is the probability that they liked flip-flops the most?

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 [1]

- (c) If Chloe asks ten more people what type of footwear they like the most, do you think that the probability of liking flip-flops the most will be the same answer as you give in question (b)? You must give a reason for your answer.

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 [1]

8.

**Marine Bay
Camping & Caravan Park**



Pitch fees per night.
Tent = £12
Caravan = £16
Motor-home = £15

The Jones family invited their friends, the Williams and the Phillips families, to stay at the Marine Bay Camping and Caravan Park.

The Jones family have a caravan and stayed for 3 nights.
The Williams family have a motor-home and only stayed for one night.
The Phillips family stayed in a tent.

The total fee for the 3 pitches was £99.

For how many nights did the Phillips family stay?

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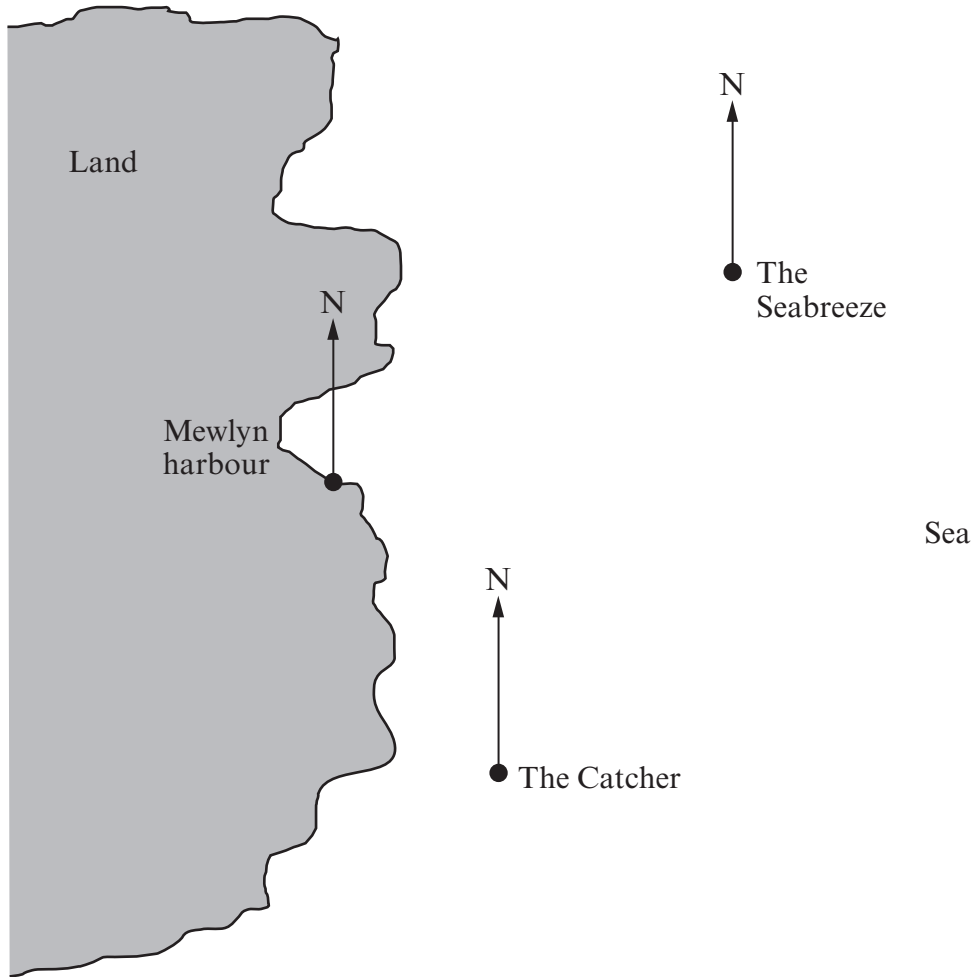
10. (a) Find the value of $\frac{76.5^3}{49.84 - 5.6}$ giving your answer correct to two decimal places.

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..... [2]

- (b) Write down the above answer correct to one significant figure.

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..... [1]

11. Two fishing trawlers, The Seabreeze and The Catcher, are working out at sea. The harbour that they take their catch to is Mewlyn harbour. The map below shows the position of the fishing trawlers and the harbour.

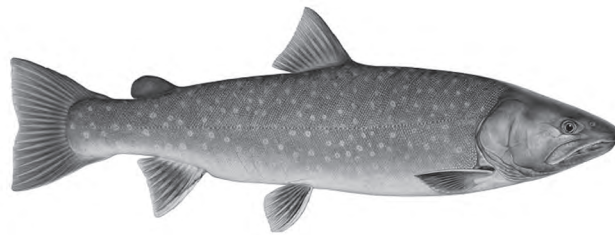


- (a) The Harbour Master needs to know the bearings of both fishing trawlers from Mewlyn harbour. Complete the table below.

| | |
|--|--|
| The bearing of The Seabreeze from Mewlyn harbour | |
| The bearing of The Catcher from Mewlyn harbour | |

[2]

- (b) Due to a storm both fishing trawlers are unable to dock at Mewlyn harbour. Both fishing trawlers can dock at a harbour which is on a bearing of 220° from The Seabreeze and 300° from The Catcher. Mark the position of this harbour on the given map on the opposite page. [3]
- (c) A fisherman on The Catcher takes a photograph of one of the fish caught.



The scale of the photograph is 1:5.

What is the actual length of the fish?
Give the units of your answer.

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[4]

12. Write down expressions for each of the following.

(a) The total cost of 10 pencils at g pence each and 5 pens at h pence each.

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(b) The perimeter of a rectangle with length l cm and width w cm.

[2]

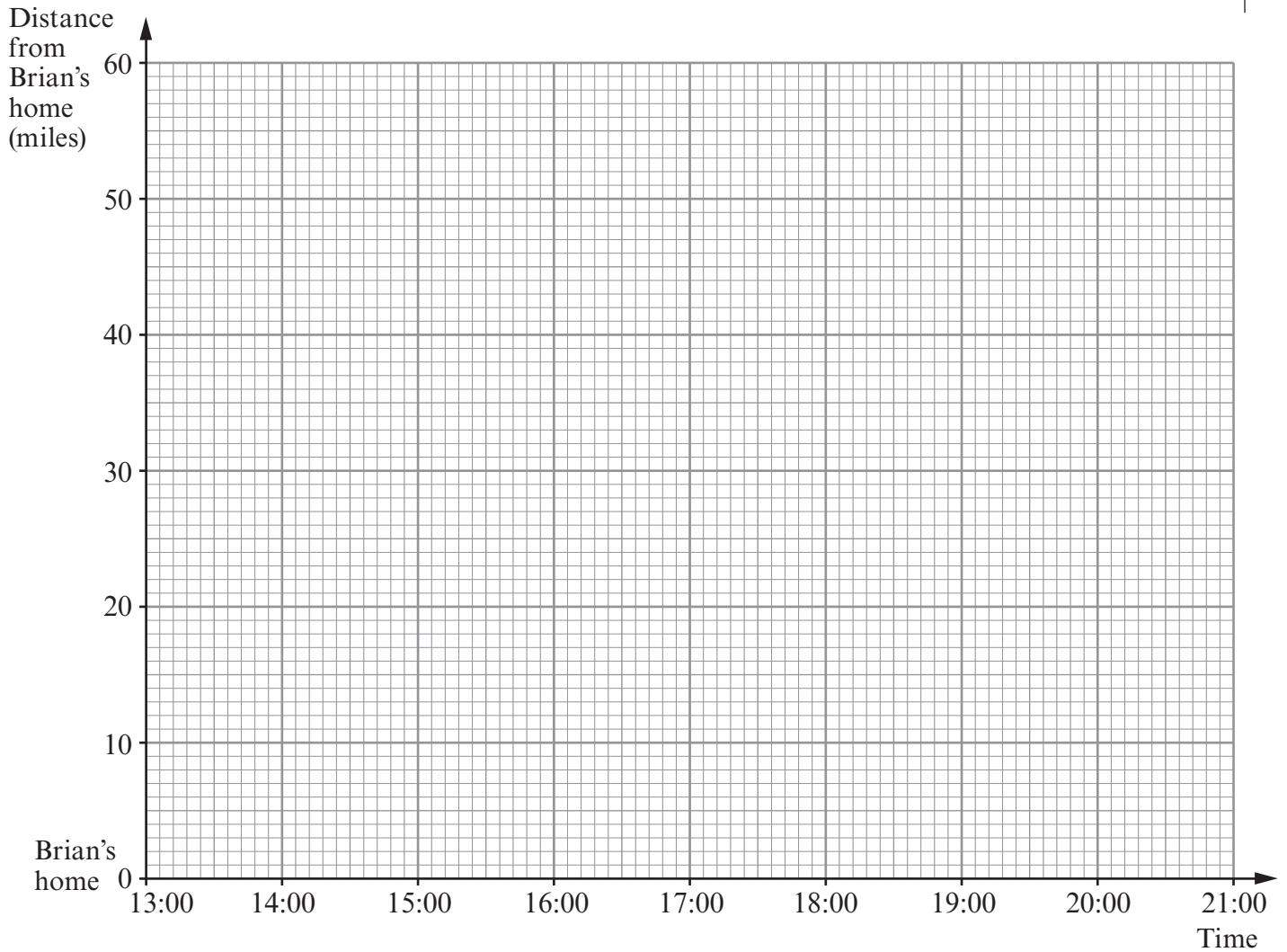
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[2]

13. Brian starts from home at 13:00 and travels at a constant speed, to visit his friend who is 60 miles away.
He takes one and a half hours to travel to his friend's house.
Once he arrives at his friend's house he stays for an hour and three quarters.
Travelling at a constant speed, his journey home takes two hours.

(a) Draw the travel graph to show Brian's journey.

[3]



(b) How far was Brian from home at 17:00?

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[1]

14. Sasha has designed a new two dimensional logo for her company. The logo is to be printed on all official company paper. A sketch of the logo is shown below.

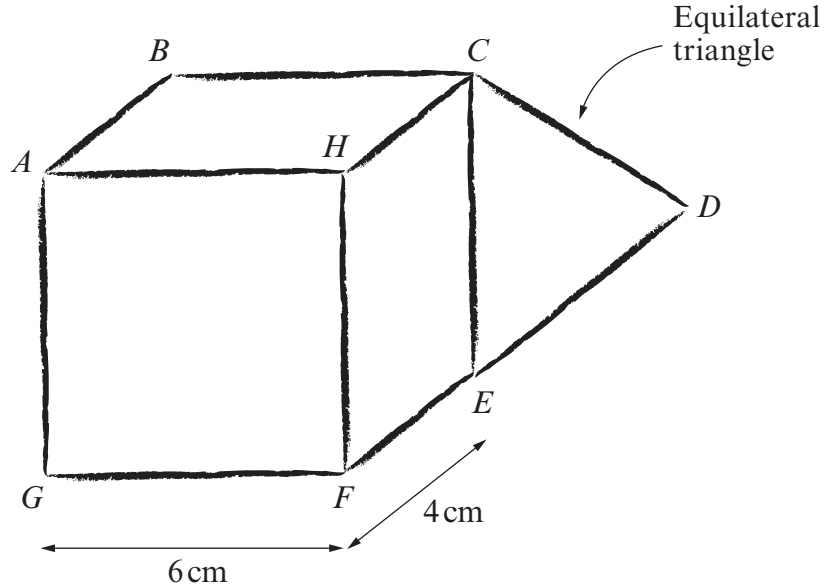


Diagram not drawn to scale

The idea for the logo is based on a 2-D representation of a cube with an accurate equilateral triangle attached to one edge. On the logo, **DEF is a straight line.**

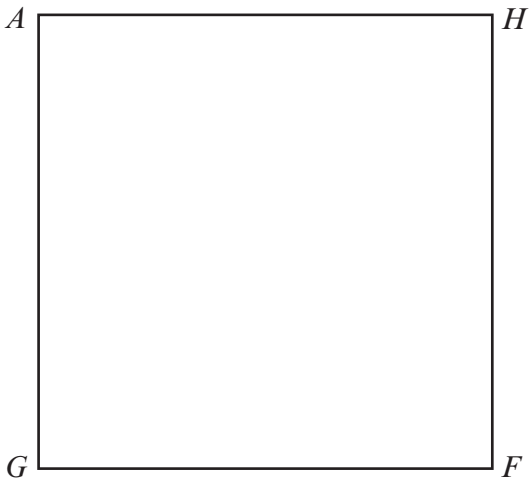
To help Sasha to draw an accurate version of the logo, she needs to identify what the actual lengths and angles will be on the logo.

- (a) Write down the actual
- size of \widehat{CED} on the logo $^{\circ}$
 - length of CE on the logo cm
 - length of AB on the logo cm.

[3]

- (b) Complete the accurate drawing of the logo on the opposite page. $AHFG$ has been drawn for you.

[4]



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