

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, 14 June 2013

$1\frac{1}{2}$  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  $\pi$  as 3.14 or use the  $\pi$  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.

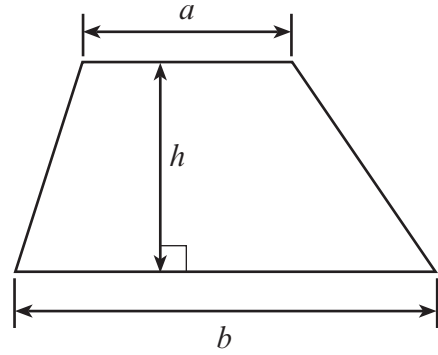
The number of marks is given in brackets at the end of each question or part-question.

You are reminded that assessment will take into account the quality of written communication (including mathematical communication) used in your answer to question 1(b).

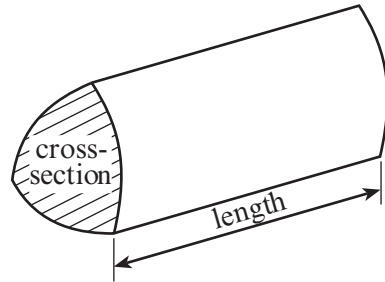
For Examiner's use only		
Question	Maximum Mark	Mark Awarded
1	9	
2	16	
3	3	
4	5	
5	3	
6	12	
7	4	
8	7	
9	8	
10	3	
11	10	
<b>TOTAL MARK</b>		

**Formula List**

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



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

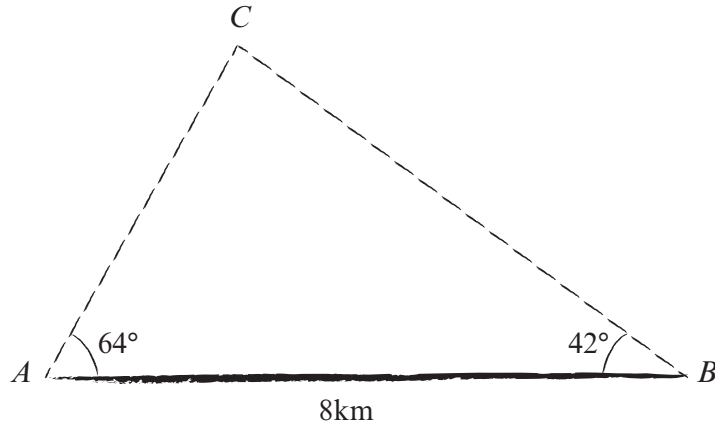


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- (b) Coastguard stations, at  $A$  and  $B$ , are 8 km apart, with  $B$  due East of  $A$ . A sailor in trouble at sea sets off a flare at  $C$ , which is seen by both coastguard stations. The position of  $C$  from each coastguard station is shown in the sketch below.



*Diagram not drawn to scale*

Using a scale of 1 cm to represent 1 km, construct an accurate triangle to show this information and use it to find the distance of  $C$  from each of the coastguard stations.

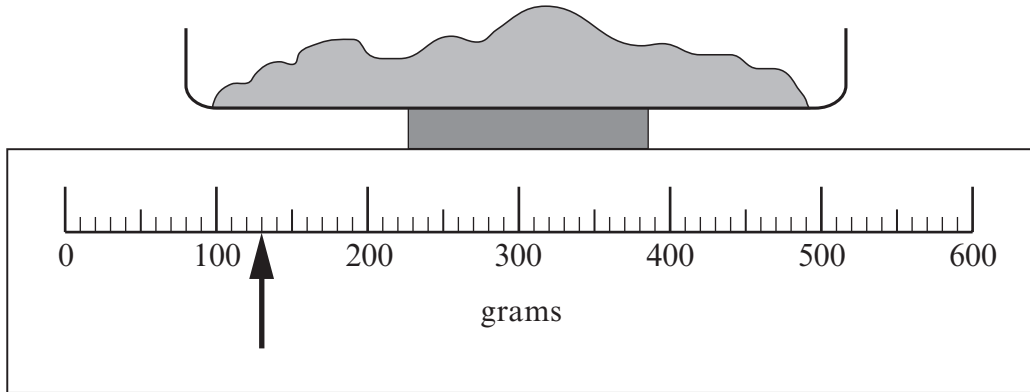
Distance of  $C$  from  $A$  = ..... km

Distance of  $C$  from  $B$  = ..... km

[5]



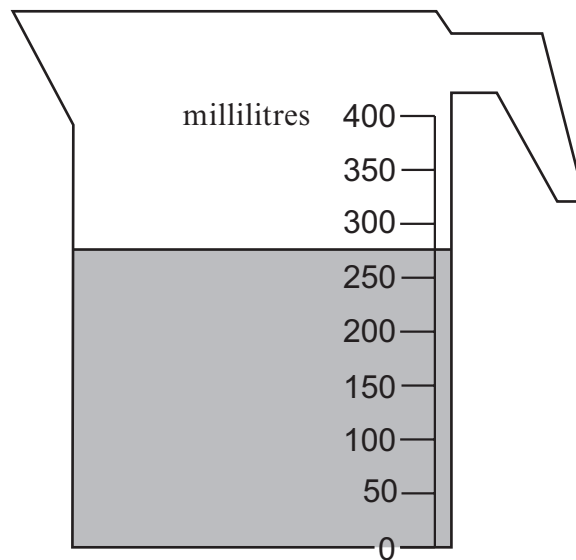
3. Asim used flour, milk and eggs to make pancakes.  
He weighed the flour and measured the milk.  
His measurements are shown on the diagrams below.



What does the flour weigh?

Weight of flour = ..... grams.

[1]



What is the volume of milk?

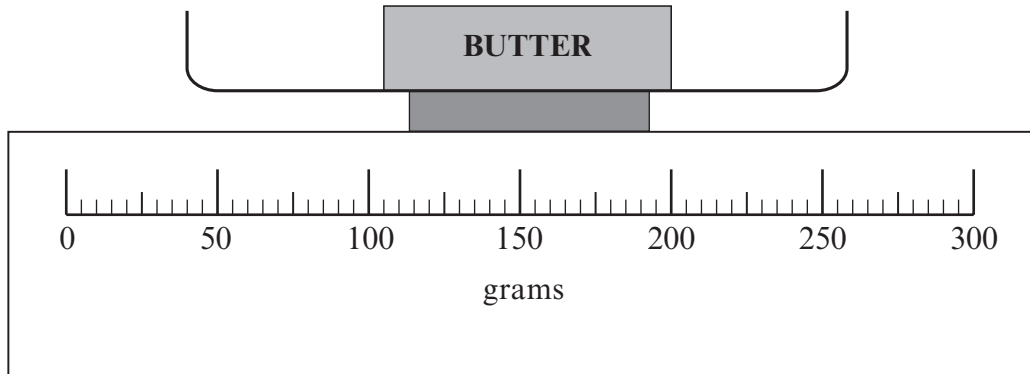
Volume of milk = ..... millilitres.

[1]



Asim also needs 65 grams of butter.

Draw a pointer on the following scale to show the weight of 65 grams of butter.



[1]

Examiner  
only

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4. There were 8652 people watching a rugby match.

(a) Two thirds of the people were supporting the home side.  
How many people were supporting the home side?

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.....  
.....  
.....

[2]

(b) At half-time, 4120 hot-dogs were sold to children and adults in the ratio 5:3 respectively.  
How many hot-dogs were sold to children?

.....  
.....  
.....  
.....

Hot-dogs sold to children .....

[2]

(c) The radio report said

“... there were around 9000 people at the match.”

Explain why this was a reasonable comment.

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.....  
.....  
.....  
.....

[1]

5. (a) Complete the probabilities for the events given in the following table.

Event	Probability
<b>A</b> Getting a head on a single throw of a fair coin.	
<b>B</b> Rolling a 4 on a single roll of an ordinary dice.	
<b>C</b> Choosing Saturday when selecting a day at random from the days of the week.	
<b>D</b> Choosing a letter <i>t</i> when selecting a letter at random from the word <i>stamp</i> .	

[2]

(b) Place the above events in increasing order of probability.

Least chance ..... [1]

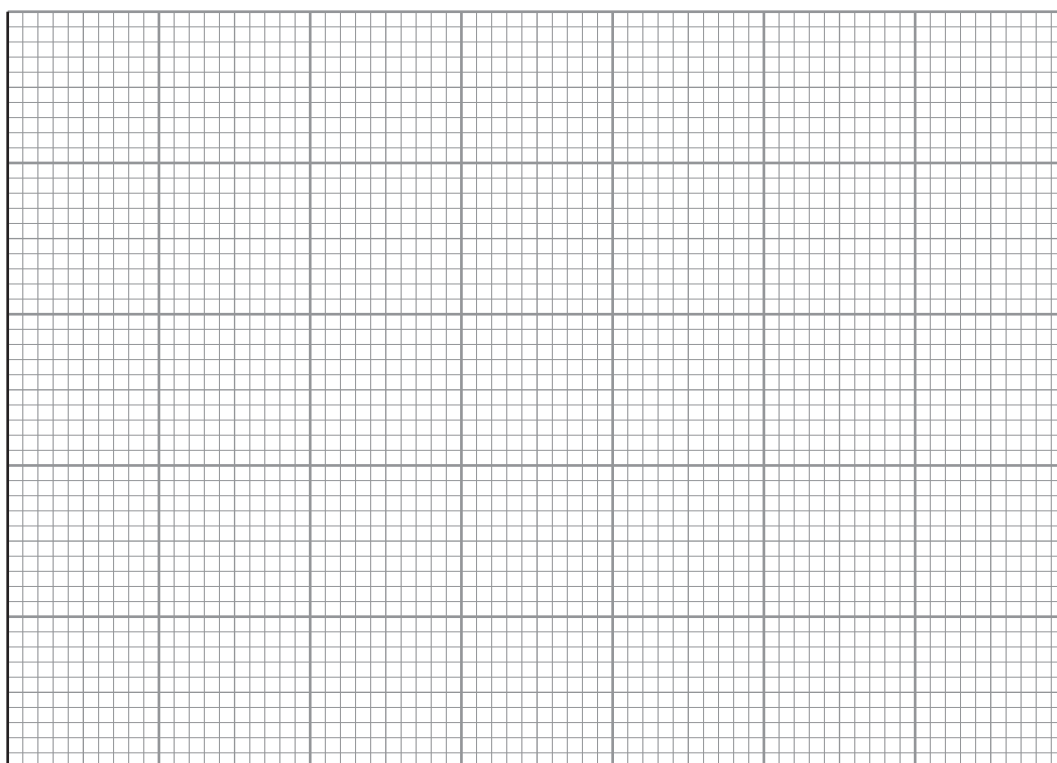
Greatest chance

[1]

6. During a day on Anglesey, the wind-speed in miles per hour (m.p.h.), was measured every three hours. The table below shows the information that was recorded.

Time	00:00	03:00	06:00	09:00	12:00	15:00	18:00	21:00
Wind-speed (m.p.h.)	5	3	10	14	15	19	15	11

- (a) (i) Draw a time series graph to show the above information.



[4]

- (ii) Explain clearly what the graph shows about the wind-speed on Anglesey on this day.

.....

.....

.....

.....

[1]

(b) Find the mean, median, mode and range of the recorded wind-speeds given in the table on the previous page.

Mean

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.....

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Median

.....

.....

.....

Mode

.....

.....

Range

.....

.....

[7]

7.



To donate blood you:

- must be aged between 17 and 65;
- must weigh at least 50 kg;
- can only give blood once every 16 weeks or approximately 4 months.

Use the table to decide which of the following people could donate blood today?

	Age	Weight (kg)	Time since last donation
<b>Charlotte</b>	32	66	5 months
<b>Aaron</b>	66	90	20 weeks
<b>Siân</b>	24	48	6 months
<b>Alun</b>	51	82	14 weeks

You must:

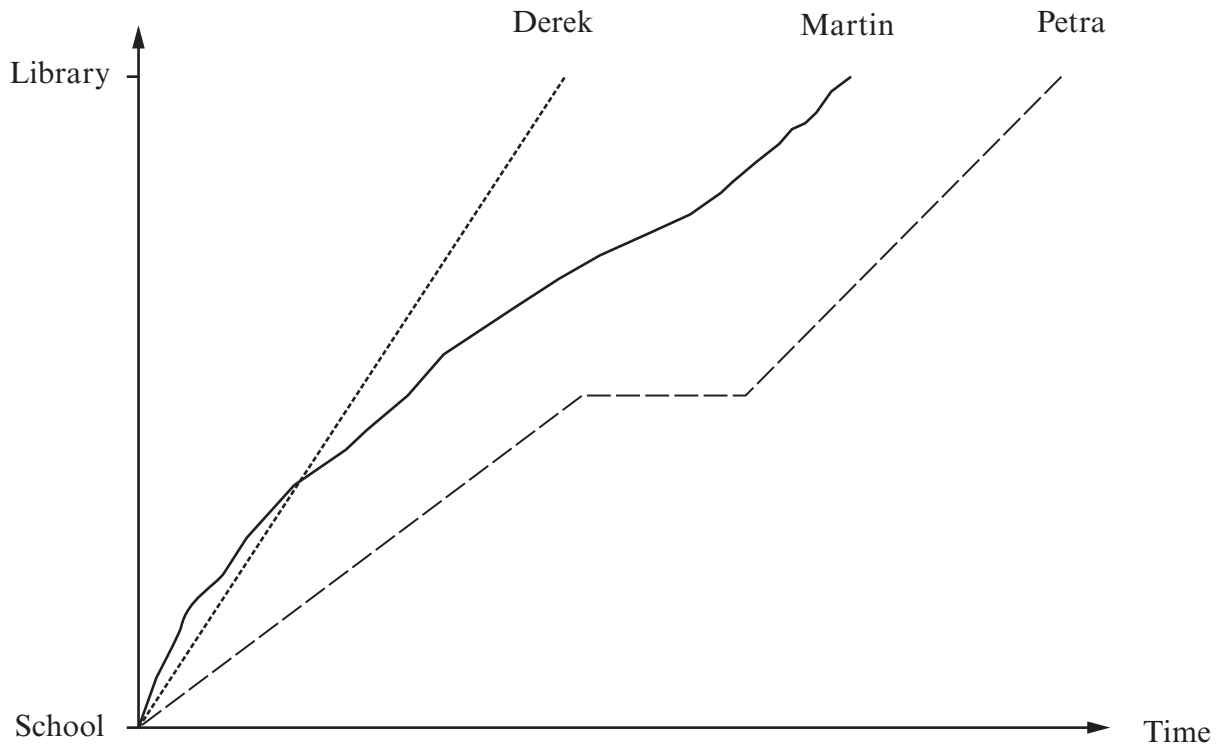
- consider each person;
- give a reason why each person could or could not give blood.

Write your answers in the table below.

	Could donate blood today? Yes or No	Reason
<b>Charlotte</b>		
<b>Aaron</b>		
<b>Siân</b>		
<b>Alun</b>		

[4]

8. The following graphs represent the journeys of Petra, Martin and Derek cycling to the library from their school. They all started their journey at the same time.



(a) Who arrived at the library first?

..... [1]

(b) Who stopped on the way to the library? How does the graph show this?

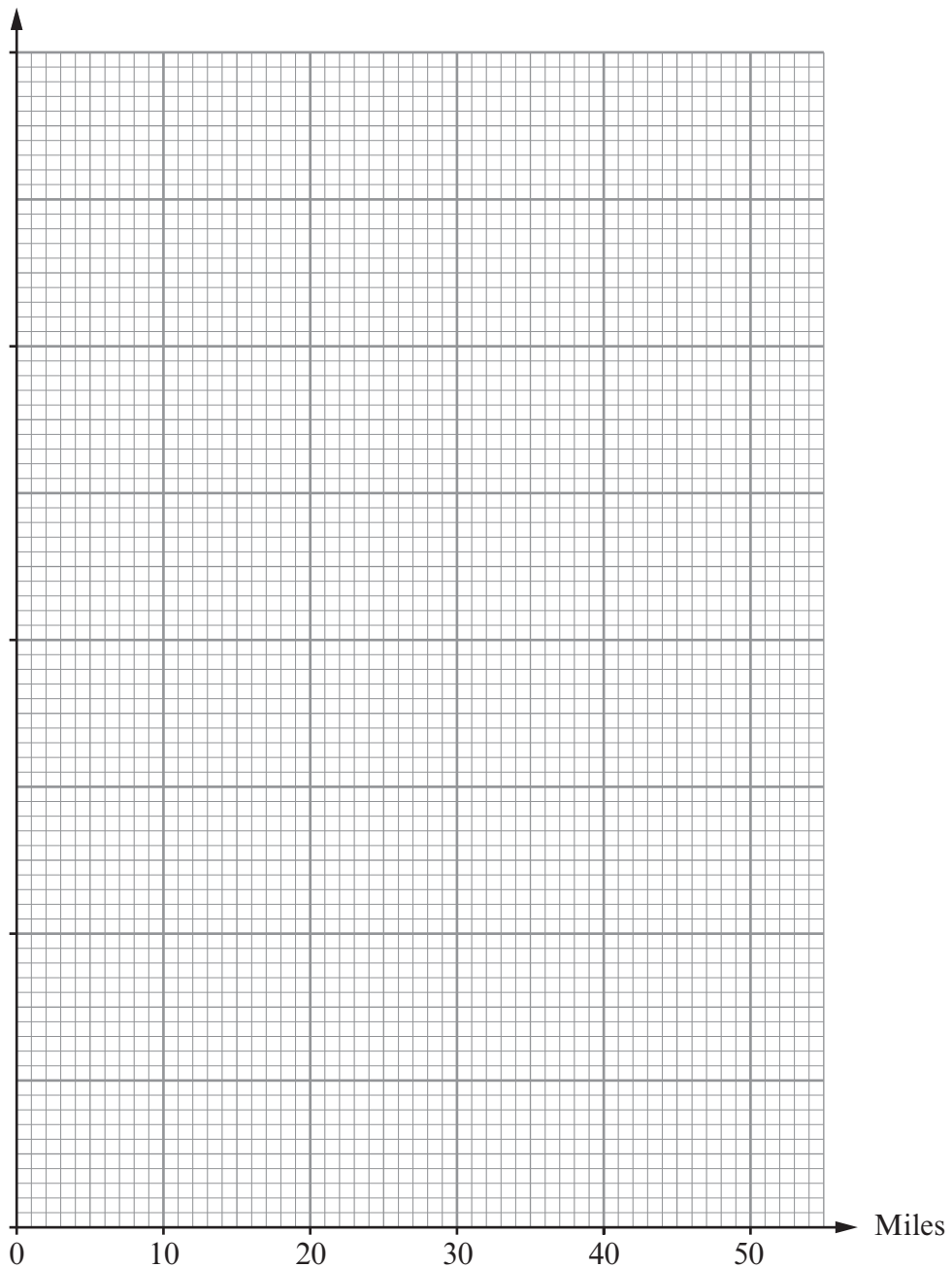
.....  
 .....  
 ..... [1]

- (c) Martin prefers to measure distances in kilometres rather than miles.  
The following table shows the number of miles and the number of kilometres for each of three distances.

Miles	5	30	42.5
Kilometres	8	48	68

- (i) Use the data in the table to draw a conversion graph.

Kilometres



[3]



(ii) The distance between Martin’s house and his favourite bicycle shop is 70 miles.

- Explain how he can use the graph to find this distance in kilometres.

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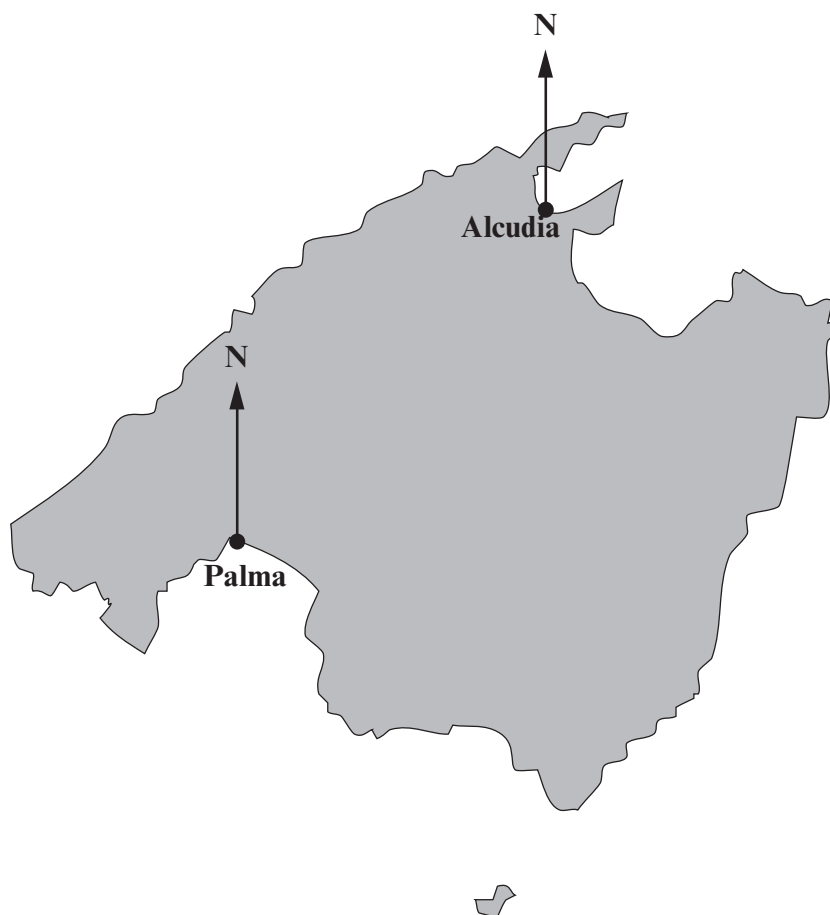
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- Complete the following sentence:

70 miles is approximately ..... km.

[2]

9. The map below shows the island of Majorca.



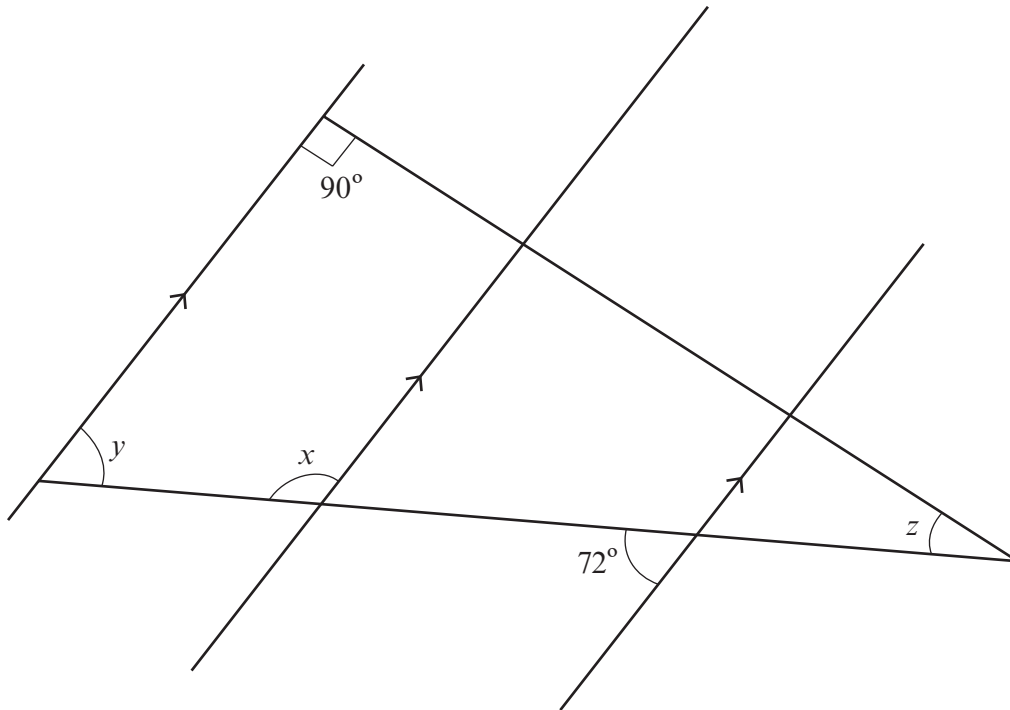
- (a) Find the bearing of Palma from Alcudia. .... °

[1]

- (b) Artá is another place on the island of Majorca.  
Artá is on a bearing of  $073^\circ$  from Palma and on a bearing of  $130^\circ$  from Alcudia.  
Indicate where Artá is on the above map of Majorca.

[3]

- (c) A new runway site is being planned for a different island.  
A diagram of the plan for the runway site is shown below.



*Diagram not drawn to scale*

Find the size of the angles  $x$ ,  $y$  and  $z$ .

.....

.....

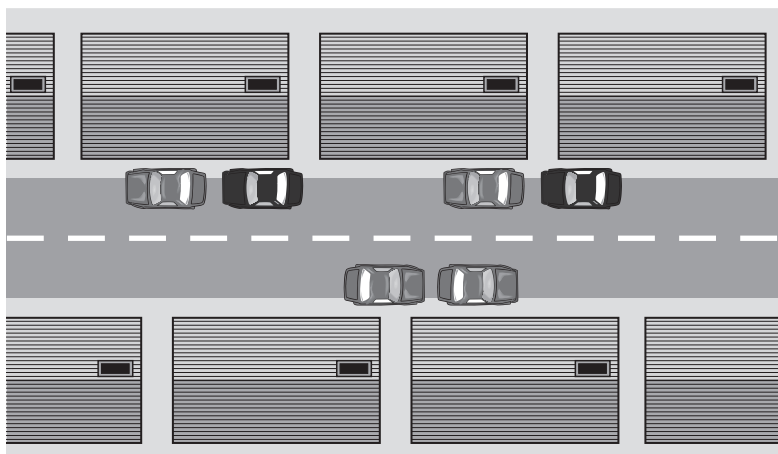
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.....

$x = \dots\dots\dots^\circ$        $y = \dots\dots\dots^\circ$        $z = \dots\dots\dots^\circ$

[4]

10. (a) The diagram shows an aerial view of some cars parked in a street in Spain. The scale of the map is not shown.



Using the cars as a guide, complete the following statement.

**1 cm represents approximately ..... metres**

[1]

- (b) A different aerial view shows a tree with its branches spreading 2 metres in all directions from the tree trunk.  
The tree has many branches and many, many leaves.  
Using a scale of 1 cm to represent 0.5 metres, show how this tree would look from an aerial view.

[2]

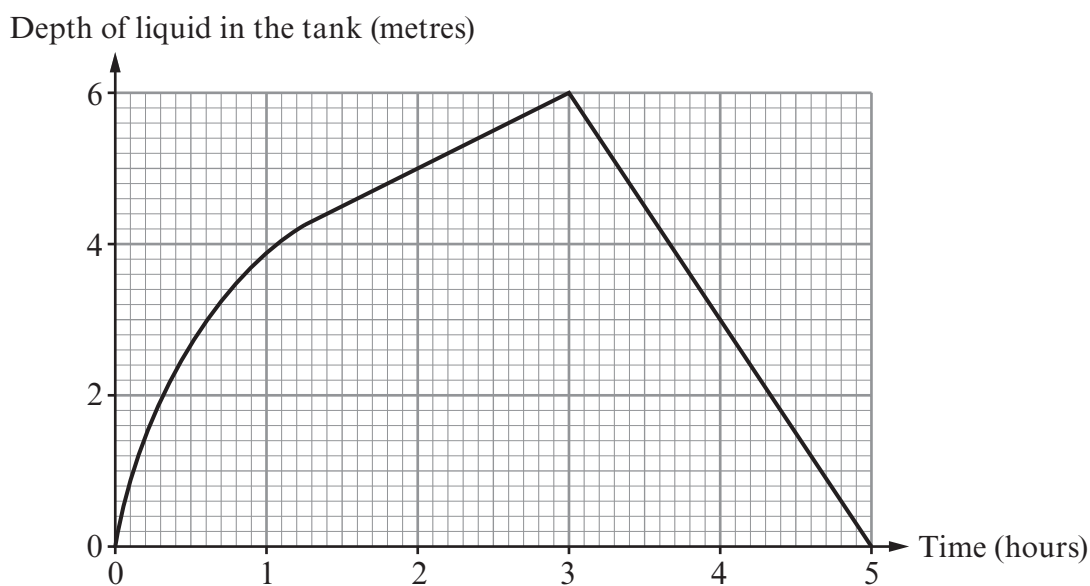
•  
Tree trunk

11. A chemical factory makes a liquid that is used in the production of a waterproof fabric. A cylindrical tank is used to collect the liquid made in the factory.

The moment the tank is full, it starts to empty the liquid into a tanker in readiness for delivery to a company which makes the waterproof fabric.

**This process is continuous during the week, but the production stops at weekends for maintenance.**

The graph shows the process of the tank being filled and emptied into the tanker.



- (a) What is the depth of the liquid in the tank  $2\frac{1}{2}$  hours into the process?

..... metres

[1]

- (b) How long, in minutes, does it take to half fill the cylindrical tank?

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.....

.....

.....

[2]

