

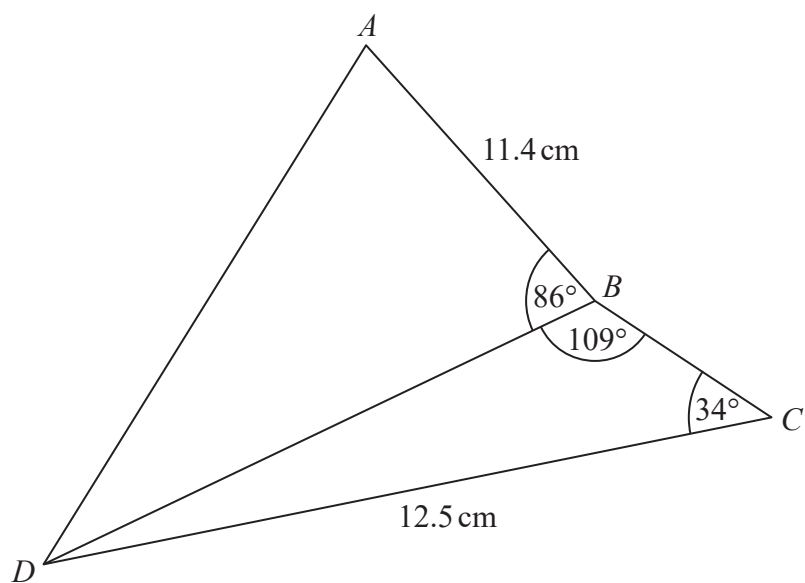
**GCSE Grade 8/9**

**Maths**  
**Booklet 2**

Paper 3H  
Calculator

[www.ggmaths.co.uk](http://www.ggmaths.co.uk)

1



Work out the length of  $AD$ .

Give your answer correct to 3 significant figures.

..... cm

(Total for Question 1 is 5 marks)



2 (a) Show that the equation  $x^3 + x = 7$  has a solution between 1 and 2

(2)

(b) Show that the equation  $x^3 + x = 7$  can be rearranged to give  $x = \sqrt[3]{7 - x}$

(1)

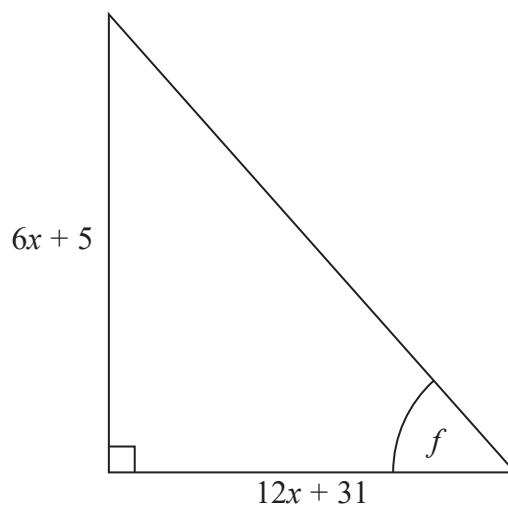
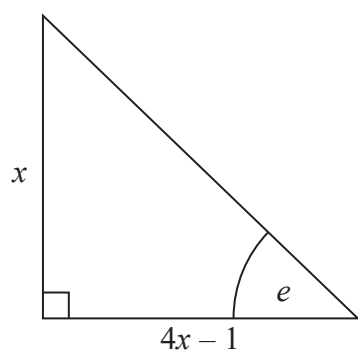
(c) Starting with  $x_0 = 2$ ,  
use the iteration formula  $x_{n+1} = \sqrt[3]{7 - x_n}$  three times to find an estimate for a  
solution of  $x^3 + x = 7$

(3)

(Total for Question 2 is 6 marks)



3 Here are two right-angled triangles.



Given that

$$\tan e = \tan f$$

find the value of  $x$ .

You must show all your working.

(Total for Question 3 is 5 marks)



4 50 people were asked if they speak French or German or Spanish.

Of these people,

31 speak French

2 speak French, German and Spanish

4 speak French and Spanish but not German

7 speak German and Spanish

8 do not speak any of the languages

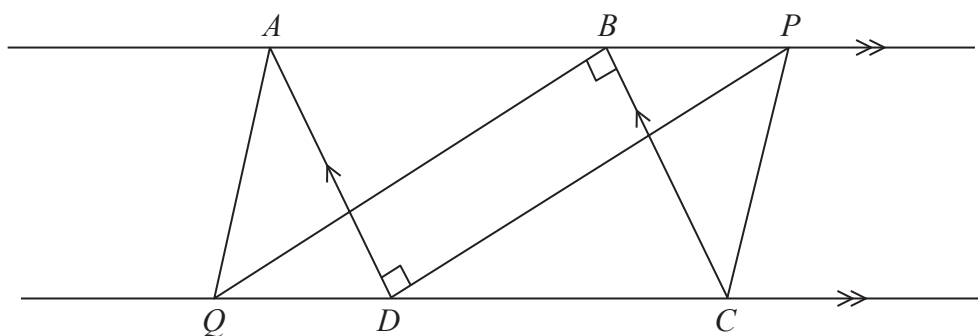
all 10 people who speak German speak at least one other language

Two of the 50 people are chosen at random.

Work out the probability that they both only speak Spanish.

(Total for Question 4 is 5 marks)





$ABCD$  is a parallelogram.

$ABP$  and  $QDC$  are straight lines.

Angle  $ADP = \text{angle } CBQ = 90^\circ$

(a) Prove that triangle  $ADP$  is congruent to triangle  $CBQ$ .

(3)

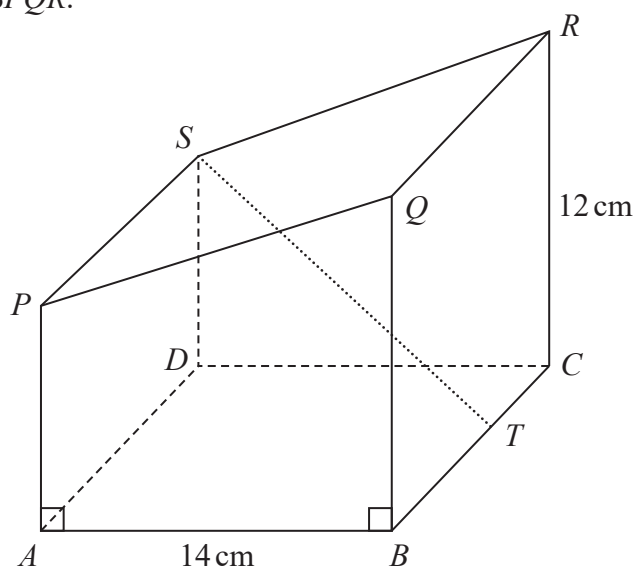
(b) Explain why  $AQ$  is parallel to  $PC$ .

(2)

(Total for Question 5 is 5 marks)



66 Here is a prism  $ABCDSPQR$ .



The base  $ABCD$  of the prism is a square of side  $14\text{ cm}$   
 $T$  is the point on  $BC$  such that  $BT : TC = 4 : 3$

The cross section of the prism is in the shape of a trapezium of area  $147\text{ cm}^2$   
 $CR = 12\text{ cm}$

Find the size of the angle between the line  $ST$  and the base  $ABCD$ .  
 Give your answer correct to 1 decimal place.

(Total for Question 6 is 5 marks)



- 7 Show that  $\frac{3x}{x+2} - \frac{2x+1}{x-2} - 1$  can be written in the form  $\frac{ax+b}{x^2-4}$   
where  $a$  and  $b$  are integers.

(Total for Question 7 is 4 marks)





- 8 The profit made by a shop increases each year.

The profit made by the shop in year  $n$  is  $\text{£}P_n$

Given that the profit made by the shop in the next year is  $\text{£}P_{n+1}$  then

$$P_{n+1} = aP_n + 800 \text{ where } a \text{ is a constant.}$$

The table shows the profit made by the shop in 2018 and in 2019

Year	2018	2019
Profit	£24 000	£29 600

Work out the profit predicted to be made by the shop in 2021

£.....

(Total for Question 8 is 4 marks)



9 Ray has nine cards numbered 1 to 9



Ray takes at random three of these cards.

He works out the sum of the numbers on the three cards and records the result.

Work out the probability that the result is an even number.

(Total for Question 9 is 4 marks)



**10** L is the straight line with equation  $y = 2x - 5$

C is a graph with equation  $y^2 = 6x^2 - 25x - 8$

Using algebra, find the coordinates of the points of intersection of L and C.  
You must show all your working.

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

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

(Total for Question 10 is 5 marks)

