


Write your name here							
Surname			Other names				
<b>Pearson Edexcel International GCSE</b>		Centre Number			Candidate Number		
<b>Mathematics A</b>					 <b>Higher Tier</b>		
<b>Practice paper 4H</b>							
<b>Time: 2 hours</b>				Paper Reference <b>4MA1/PP4H</b>			
<b>You must have:</b> Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser, calculator. Tracing paper may be used.						Total Marks	

## Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Without sufficient working, correct answers may be awarded no marks.
- Answer the questions in the spaces provided  
– *there may be more space than you need.*
- **Calculators may be used.**
- You must **NOT** write anything on the formula page.  
Anything you write on the formulae page will gain no credit.

## Information

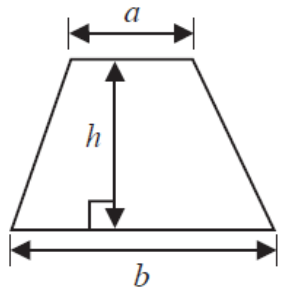
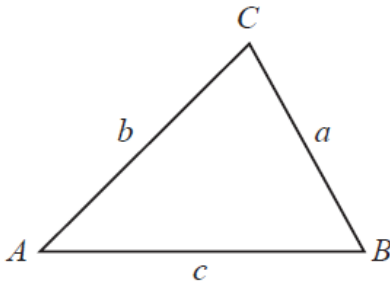
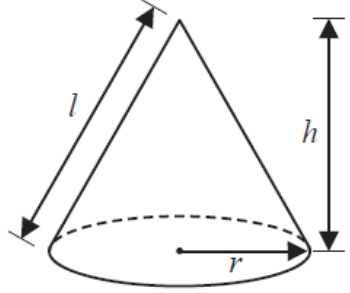
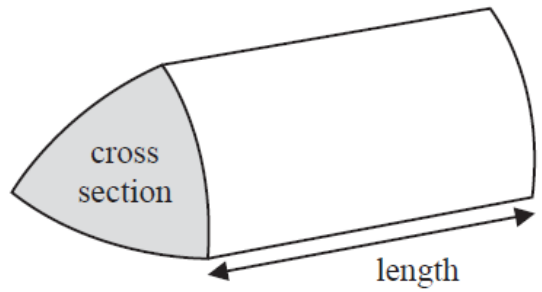
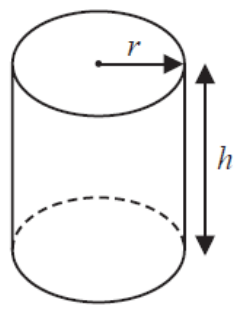
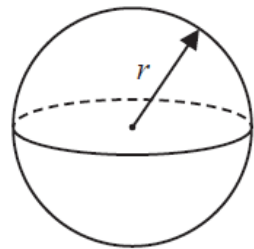
- The total mark for this paper is 100.
- The marks for **each** question are shown in brackets  
– *use this as a guide as to how much time to spend on each question.*

## Advice

- Read each question carefully before you start to answer it.
- Check your answers if you have time at the end.

## 4MA1 Practice paper 4H

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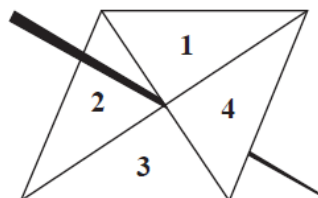
<p><b>Arithmetic series</b></p> <p>Sum to <math>n</math> terms, <math>S_n = \frac{n}{2} [2a + (n - 1)d]</math></p>	<p><b>Area of trapezium</b> <math>= \frac{1}{2}(a + b)h</math></p>
<p><b>The quadratic equation</b></p> <p>The solutions of <math>ax^2 + bx + c = 0</math> where <math>a \neq 0</math> are given by:</p> $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$	
<p><b>Trigonometry</b></p> 	<p><b>In any triangle <math>ABC</math></b></p> <p><b>Sine Rule</b> <math>\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}</math></p> <p><b>Cosine Rule</b> <math>a^2 = b^2 + c^2 - 2bc \cos A</math></p> <p><b>Area of triangle</b> <math>= \frac{1}{2}ab \sin C</math></p>
<p><b>Volume of cone</b> <math>= \frac{1}{3} \pi r^2 h</math></p> <p><b>Curved surface area of cone</b> <math>= \pi r l</math></p> 	<p><b>Volume of prism</b>  <math>= \text{area of cross section} \times \text{length}</math></p> 
<p><b>Volume of cylinder</b> <math>= \pi r^2 h</math></p> <p><b>Curved surface area of cylinder</b> <math>= 2\pi r h</math></p> 	<p><b>Volume of sphere</b> <math>= \frac{4}{3} \pi r^3</math></p> <p><b>Surface area of sphere</b> <math>= 4\pi r^2</math></p> 

**Answer ALL TWENTY THREE questions.**

**Write your answers in the spaces provided.**

**You must write down all the stages in your working.**

- 1** Here is a biased 4-sided spinner.



The spinner is spun.

The table shows the probability that the spinner lands on 1 and the probability that it lands on 2.

<b>Number</b>	1	2	3	4
<b>Probability</b>	0.15	0.4		

- (a) Work out the probability that the spinner will land on 1 or on 2.

.....  
(1)

The probability that the spinner will land on 3 is twice the probability that the spinner will land on 4.

- (b) Work out the probability that the spinner will land on 3.

.....  
(2)

Daljit is going to spin the spinner 160 times.

- (c) Work out an estimate for the number of times the spinner will land on 2.

.....  
(2)

**(Total for Question 1 is 5 marks)**

2  $y$  is an integer.

$$-2 < y \leq 3$$

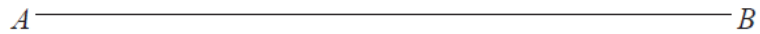
Write down all the possible values of  $y$ .

.....

**(Total for Question 2 is 2 marks)**

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3 Use ruler and compasses only to construct the perpendicular bisector of line  $AB$ .  
You must show all your construction lines.



**(Total for Question 3 is 2 marks)**

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**4**  $2.2 \times 10^7$  passengers passed through Beijing Capital International Airport in 2014.

(a) Write  $2.2 \times 10^7$  as an ordinary number.

.....  
**(1)**

950 000 tonnes of cargo traffic passed through Tokyo International Airport in 2014.

(b) Write 950 000 as a number in standard form.

.....  
**(1)**

(c) Work out  $\frac{4.2 \times 10^4}{700000}$

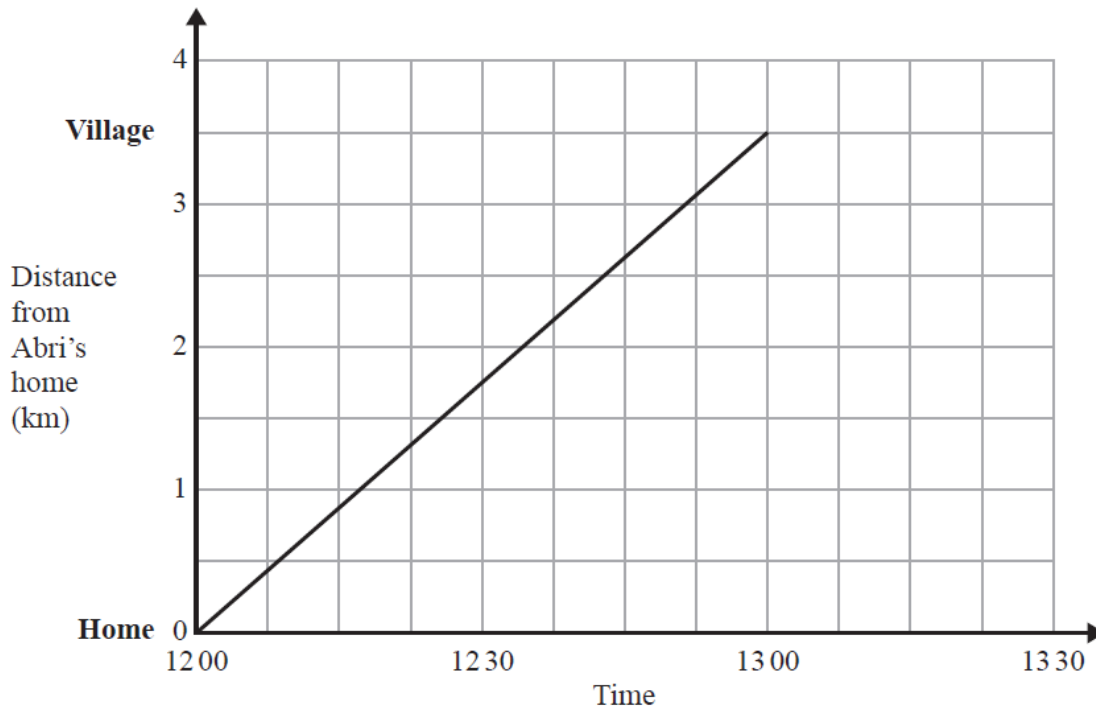
Give your answer in standard form.

.....  
**(1)**

**(Total for Question 4 is 4 marks)**

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- 5 Abri walks along a path from her home to a local village.  
Here is the distance-time graph for her journey from her home to the village.



Benito leaves the village at 12 30 and walks at a constant speed along the same path to Abri's home.  
He arrives at Abri's home at 13 15

- (a) Show the information about Benito's journey on the grid. (2)
- (b) How far from the village were Abri and Benito when they passed each other?

..... km  
(1)

**(Total for Question 5 is 3 marks)**

**6**  $P \cup Q = \{a, b, c, d, e, f\}$   
 $P \cap Q = \{e\}$   
 $a \in P, c \in Q, f \notin Q, \{b, d\} \cap Q = \emptyset$

(a) List the members of the set  $P$ .

.....  
**(2)**

(b) List the members of the set  $Q$ .

.....  
**(1)**

**(Total for Question 6 is 3 marks)**

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**7** Solve  $\frac{3-5m}{4} = 8$

Show clear algebraic working.

$m = \dots\dots\dots$

**(Total for Question 7 is 3 marks)**

---

8 The diagram shows the positions of two towns,  $A$  and  $B$ .

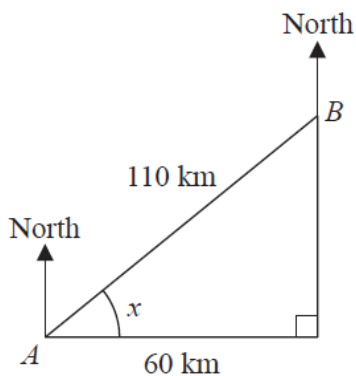


Diagram **NOT** accurately drawn

The distance from  $A$  to  $B$  is 110 km.  
 $B$  is 60 km east of  $A$ .

- (a) Work out the size of angle  $x$ .  
 Give your answer correct to 1 decimal place.

.....<sup>o</sup>  
 (3)

- (b) Work out the bearing of  $B$  from  $A$ .  
 Give your answer correct to the nearest degree.

.....<sup>o</sup>  
 (2)

The distance from  $A$  to  $B$  is 110 km correct to 2 significant figures.

- (c) (i) Write down the lower bound for the distance from  $A$  to  $B$ .

..... km

- (ii) Write down the upper bound for the distance from  $A$  to  $B$ .

..... km  
 (2)

**(Total for Question 8 is 7 marks)**



**9** Solve the simultaneous equations

$$5x - 2y = 33$$

$$5x + 8y = 18$$

Show clear algebraic working.

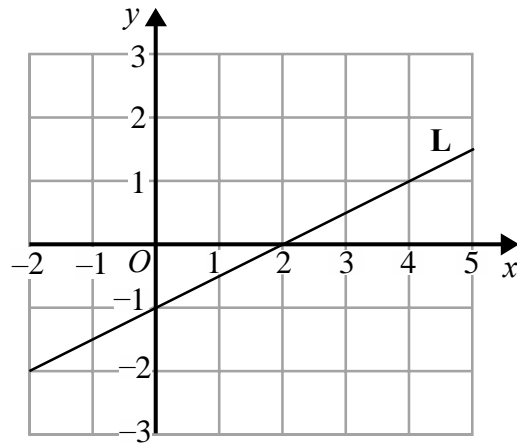
$x = \dots\dots\dots$

$y = \dots\dots\dots$

**(Total for Question 9 is 3 marks)**

---

10 The straight line **L** is shown on the grid.



(a) Find an equation of **L**.

.....  
(2)

(b) Find an equation of the line that is parallel to **L** and passes through the point (5, 4)

.....  
(2)

**(Total for Question 10 is 4 marks)**

11 Here is a regular 10-sided polygon.

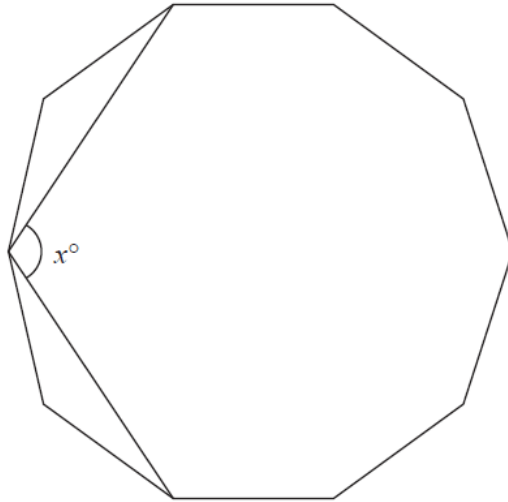


Diagram **NOT** accurately drawn

Work out the value of  $x$ .  
Show your working clearly.

$x = \dots\dots\dots$

**(Total for Question 11 is 4 marks)**

12 Make  $t$  the subject of  $5(t - g) = 2t + 7$

.....  
**(Total for Question 12 is 3 marks)**

---

13 Amil invests £9000 for 3 years in a savings account.  
He gets 1.8% per year compound interest.

How much money will Amil have in his savings account at the end of 3 years?

£.....

**(Total for Question 13 is 3 marks)**

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14

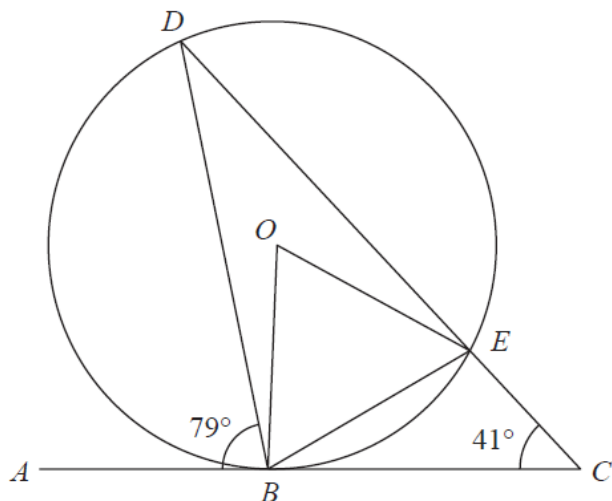


Diagram **NOT** accurately drawn

$B$ ,  $D$  and  $E$  are points on a circle, centre  $O$ .  
 $ABC$  is a tangent to the circle.  
 $DEC$  is a straight line.  
Angle  $ABD = 79^\circ$  and angle  $ECB = 41^\circ$

(a) Write down the size of angle  $BED$ .

.....<sup>o</sup>  
(1)

(b) Work out the size of angle  $BOE$ .

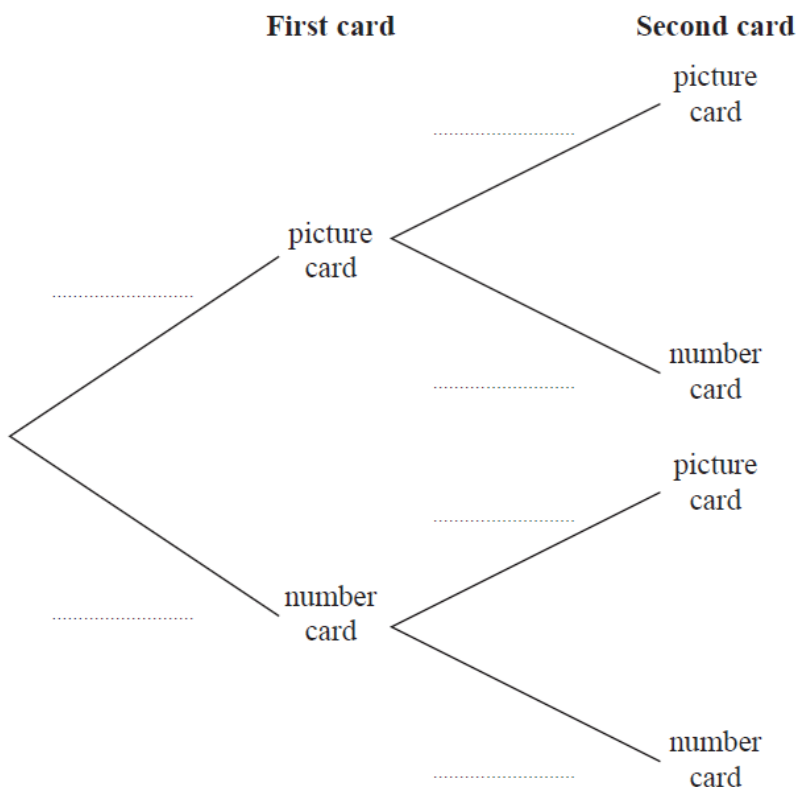
.....<sup>o</sup>  
(2)

(Total for Question 14 is 3 marks)

- 15** There are 52 cards in a pack.  
 12 cards are picture cards.  
 40 cards are number cards.

Melina takes at random a card from the pack.  
 She keeps the card and then takes at random a second card from the remainder of the pack.

(a) Complete the probability tree diagram.



**(3)**

(b) Work out the probability that the two cards Melina takes are both picture cards or both number cards.

.....  
**(3)**

**(Total for Question 15 is 6 marks)**

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- 16**  $P$  is directly proportional to  $r^3$   
 $P = 343$  when  $r = 3.5$

Find a formula for  $P$  in terms of  $r$ .

.....  
**(Total for Question 16 is 3 marks)**

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17

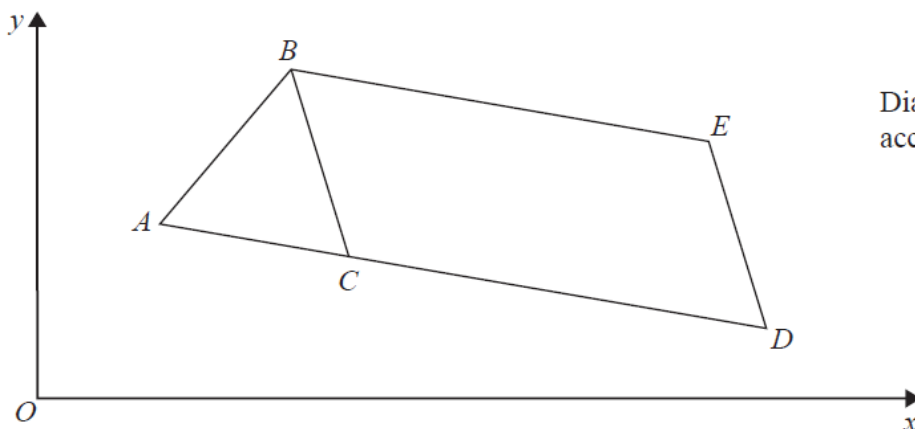


Diagram **NOT** accurately drawn

$$\vec{AB} = \begin{pmatrix} 3 \\ 2 \end{pmatrix} \text{ and } \vec{AC} = \begin{pmatrix} 4 \\ -1 \end{pmatrix}$$

(a) Find, as a column vector,  $\vec{BC}$

.....  
(2)

$BCDE$  is a parallelogram.

$$\vec{CD} = 2 \vec{AC}$$

(b) Find the length of  $CE$ .  
Give your answer correct to 2 decimal places.

.....  
(3)

(Total for Question 17 is 5 marks)



**18**  $g = 2^3 \times 3 \times 7^2$        $h = 2 \times 3 \times 7^3$

- (a) Express  $gh$  as a product of powers of its prime factors.  
Simplify your answer.

.....  
(2)

$$\frac{g}{h} = 2^a \times 3^b \times 7^c$$

- (b) Find the value of  $a$ , the value of  $b$  and the value of  $c$ .

$a =$  .....  
 $b =$  .....  
 $c =$  .....  
(2)

- (c) Show that  $(7 - 2\sqrt{5})(7 + 2\sqrt{5}) = 29$   
Show your working clearly.

(2)

$$\frac{1}{\sqrt[3]{9^4}} = 3^n$$

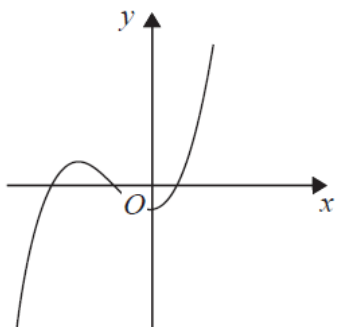
(d) Work out the exact value of  $n$ .

.....  
(3)

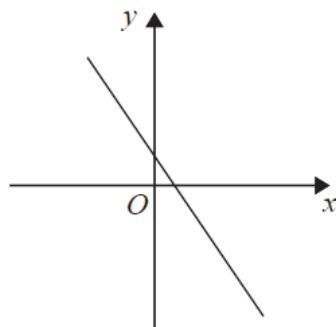
**(Total for Question 18 is 9 marks)**

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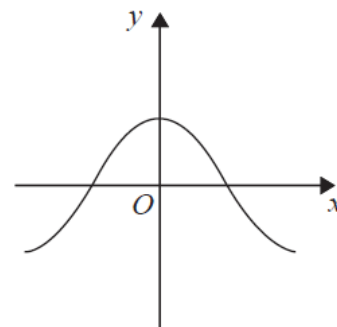
19 Here are nine graphs.



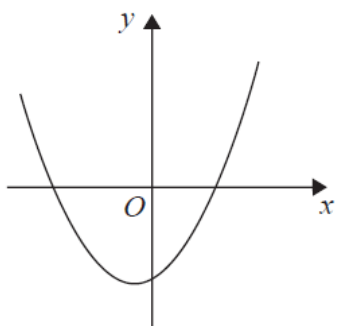
Graph A



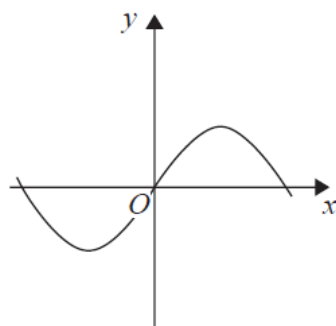
Graph B



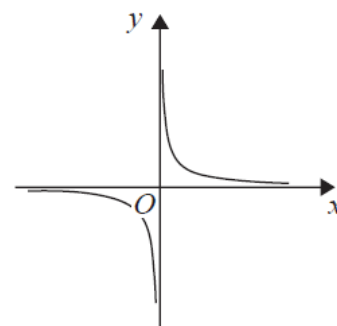
Graph C



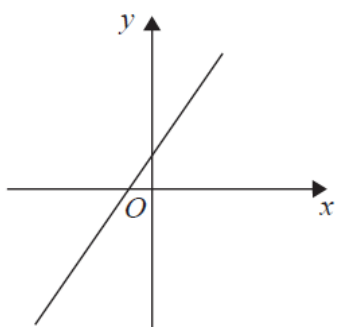
Graph D



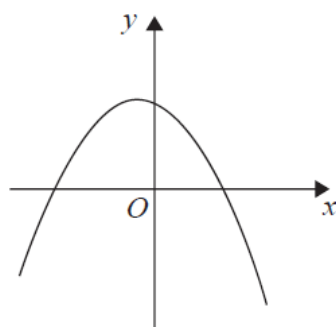
Graph E



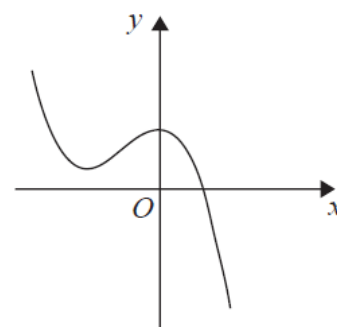
Graph F



Graph G



Graph H



Graph I

Complete the table below with the letter of the graph that could represent each given equation.

Equation	Graph
$y = \sin x$	
$y = 2 - 3x$	
$y = x^2 + x - 6$	
$y = x^3 + 3x^2 - 2$	

(Total for Question 19 is 3 marks)

**20** The function  $f$  is such that  $f(x) = \frac{2x}{3x+5}$

(a) Find  $f(-2)$

.....  
**(1)**

The function  $g$  is such that  $g(x) = \frac{3}{x+4}$

(b) Find  $g^{-1}(6)$

.....  
**(2)**

(a) Find  $fg(-5)$

.....  
**(2)**

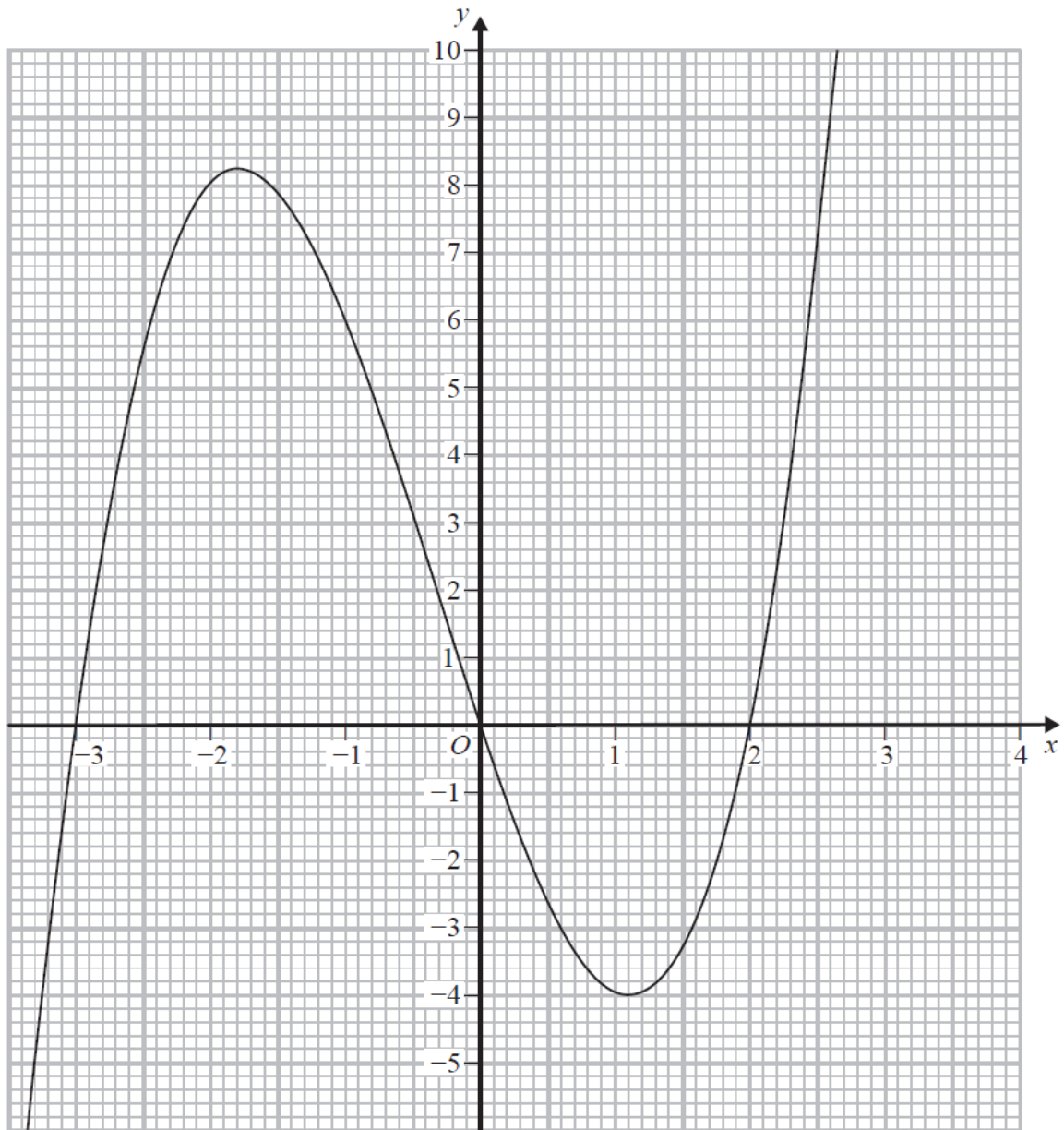
- (d) Solve the equation  $f(x) = g(x)$   
Show clear algebraic working.

.....  
(4)

**(Total for Question 20 is 9 marks)**

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21 Here is the graph of  $y = h(x)$



(a) Use the graph to find an estimate for the gradient of the curve  $y = h(x)$  at  $(-1, 6)$

.....  
(3)

(b) By drawing a suitable straight line on the grid, find an estimate for the solution of the equation  $h(x) = 7 - 2x$   
Give your answer correct to 1 decimal place.

.....  
(2)

The equation  $h(x) = k$  has 3 different solutions for  $a < k < b$

(c) Use the graph to find an estimate for the value of  $a$  and the value of  $b$ .

$a =$  .....

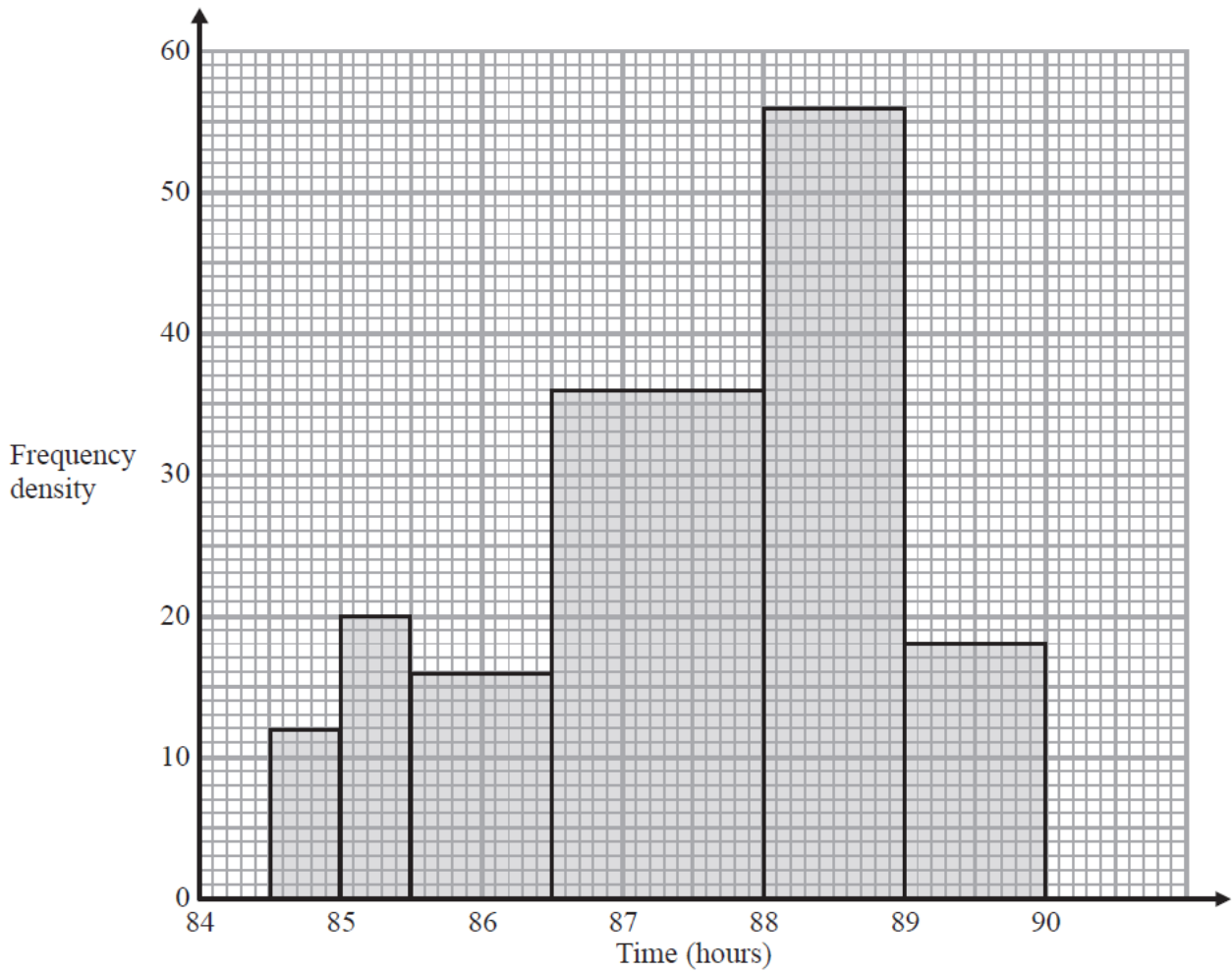
$b =$  .....

(2)

**(Total for Question 21 is 7 marks)**

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22 The histogram shows information about the times taken by 160 cyclists to complete the Tour de France cycle race.



6 cyclists took less than 85 hours.

(a) Work out an estimate for the number of the 160 cyclists who took less than 86 hours.

.....  
(2)



- (b) For these 160 cyclists, work out an estimate for the time taken by the cyclist who finished in 50th position.

..... hours  
(2)

**(Total for Question 22 is 4 marks)**

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23 The diagram shows a cuboid  $ABCDEFGH$ .

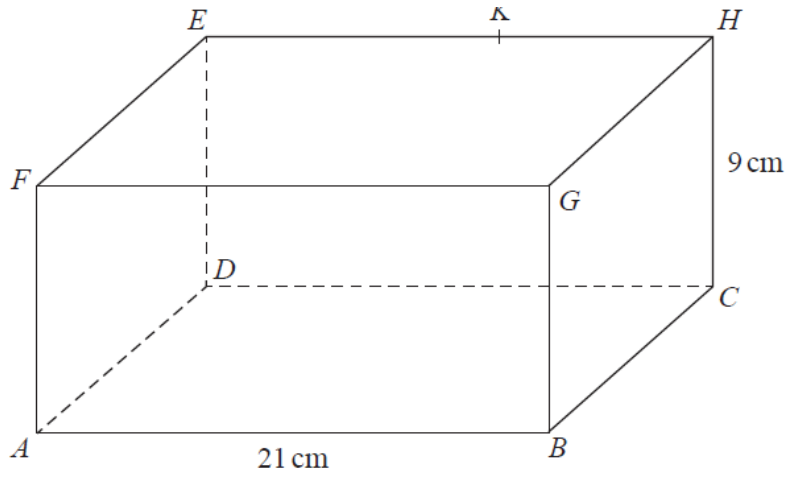


Diagram **NOT** accurately drawn

$AB = 21$  cm and  $CH = 9$  cm.

$K$  is the point on  $EH$  such that angle  $AKB = 68^\circ$  and  $BK = 16.5$  cm.

- (a) Calculate the size of angle  $BAK$ .  
Give your answer correct to 1 decimal place.

.....<sup>o</sup>  
(3)

- (b) Calculate the size of the angle between the line  $BK$  and the plane  $ABCD$ .  
Give your answer correct to 1 decimal place.

.....<sup>o</sup>  
(2)

**(Total for Question 23 is 5 marks)**

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**TOTAL FOR PAPER: 100 MARKS**