

Centre No.						Paper Reference						Surname	Initial(s)		
Candidate No.						1	3	8	0	H	/	3	H	Signature	

Paper Reference(s)

**1380H/3H**

**Edexcel GCSE**

**Mathematics (Linear) – 1380**

Paper 3 (Non-Calculator)

**Higher Tier**

Mock Paper

Time: 1 hour 45 minutes

Examiner's use only

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Team Leader's use only

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**Materials required for examination**

Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser.  
Tracing paper may be used.

**Items included with question papers**

Nil

**Instructions to Candidates**

In the boxes above, write your centre number, candidate number, your surname, initials and signature. Check that you have the correct question paper.

Answer ALL the questions. Write your answers in the spaces provided in this question paper.

**You must NOT write on the formulae page. Anything you write on the formulae page will gain NO credit.**

If you need more space to complete your answer to any question, use additional answer sheets.

**Information for Candidates**

The marks for individual questions and the parts of questions are shown in round brackets: e.g. (2).

There are 26 questions in this question paper. The total mark for this paper is 100.

There are 24 pages in this question paper. Any blank pages are indicated.

**Calculators must not be used.**

**Advice to Candidates**

Show all stages in any calculations.

Work steadily through the paper. Do not spend too long on one question.

If you cannot answer a question, leave it and attempt the next one.

Return at the end to those you have left out.

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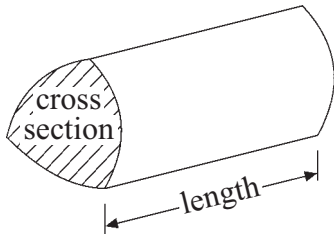
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## GCSE Mathematics (Linear)

Formulae: Higher Tier

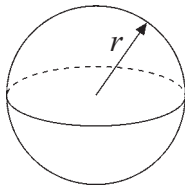
**You must not write on this formulae page.**  
**Anything you write on this formulae page will gain NO credit.**

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



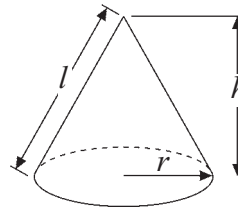
**Volume of sphere** =  $\frac{4}{3} \pi r^3$

**Surface area of sphere** =  $4\pi r^2$

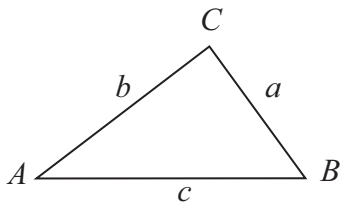


**Volume of cone** =  $\frac{1}{3} \pi r^2 h$

**Curved surface area of cone** =  $\pi r l$



**In any triangle ABC**



**The Quadratic Equation**

The solutions of  $ax^2 + bx + c = 0$

where  $a \neq 0$ , are given by

$$x = \frac{-b \pm \sqrt{(b^2 - 4ac)}}{2a}$$

**Sine Rule**  $\frac{a}{\sin A} = \frac{b}{\sin B} = \frac{c}{\sin C}$

**Cosine Rule**  $a^2 = b^2 + c^2 - 2bc \cos A$

**Area of triangle** =  $\frac{1}{2} ab \sin C$



**Answer ALL TWENTY SIX questions.**

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

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

**You must NOT use a calculator.**

1. (a) Work out an estimate for  $\frac{19.4 \times 31.3}{8.1 \times 4.9}$

.....  
(2)

- (b) Use your answer to part (a) to find an estimate for  $\frac{194 \times 3130}{81 \times 49}$

.....  
(1)

**(Total 3 marks)**

Q1

2. The price of the TV was £80  
The price increases by 15%.

Work out the new price of the TV.

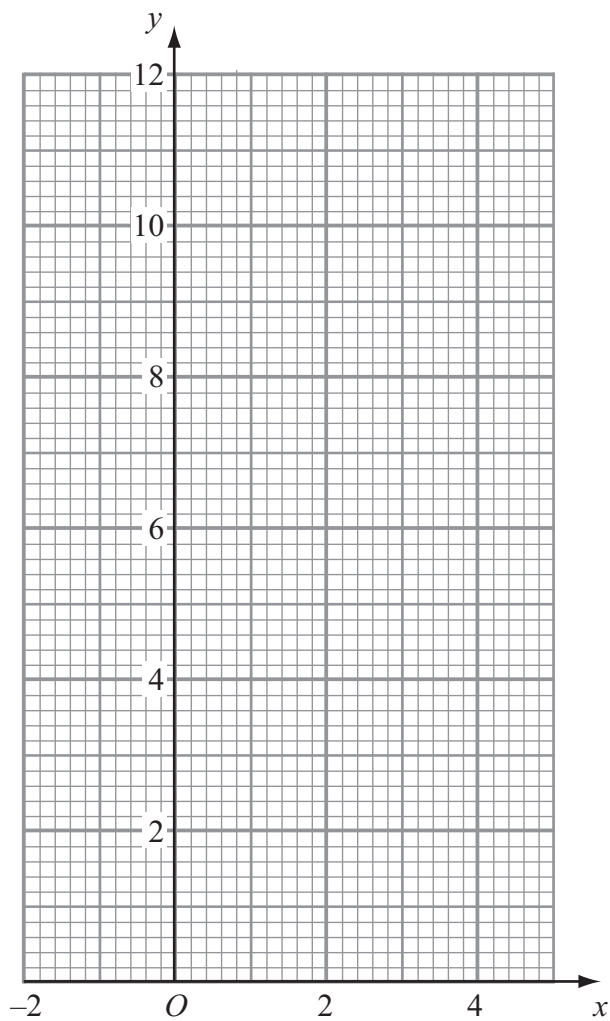
£ .....

**(Total 3 marks)**

Q2



3. Draw the graph of  $y = 10 - 2x$  for values of  $x$  from  $-1$  to  $4$ .



(Total 3 marks)

Q3



4.

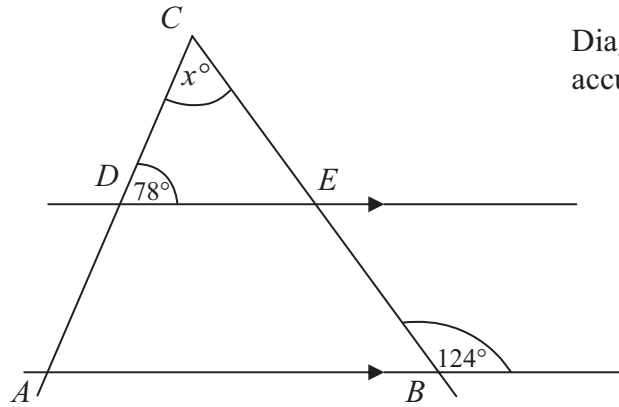


Diagram NOT accurately drawn

$ABC$  is a triangle.  
 $DE$  is a straight line parallel to  $AB$ .

Work out the value of  $x$ .

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

Give reasons for your answer.

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

**(Total 3 marks)**

**Q4**



5.

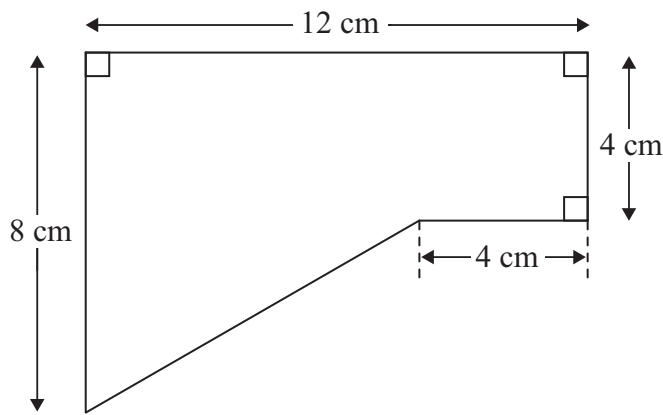


Diagram **NOT** accurately drawn

Work out the area of this shape.

..... cm<sup>2</sup>

**(Total 4 marks)**

**Q5**



6. Jane measured the lengths, in centimetres, of 15 leaves.

8.4    7.6    6.2    5.8    7.6    7.9    8.1    7.9    4.3    5.2  
6.3    6.5    8.2    4.6    7.3

Put this information into an ordered stem and leaf diagram.

You must include a key.

Q6

(Total 3 marks)

7. There are 1500 students in a school.

60% of the students are male.  
30% of the male students like tennis.  
40% of the female students like tennis.

How many students in the school like tennis?

Q7

.....  
(Total 4 marks)



8. (a) Expand and simplify  $(q + 4)(q + 5)$

.....  
(2)

(b) Expand and simplify  $(2k - 3m)(3k + 2m)$

.....  
(2)

**(Total 4 marks)**

Q8

9. Solve  $5(x + 1) = 3x + 12$

$x =$  .....

**(Total 3 marks)**

Q9





10. Work out the value of

(i)  $4^8 \div 4^6$

.....  
(2)

(ii)  $\frac{2^7 \times 2^3}{2^{11}}$

.....  
(2)

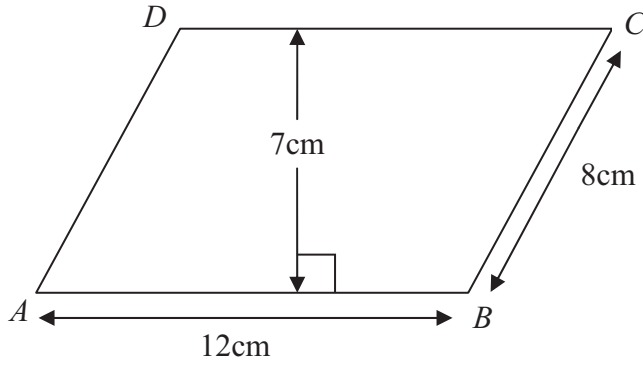
**(Total 4 marks)**

**Q10**



11.

Diagram **NOT** accurately drawn



$ABCD$  is a parallelogram

$AB = 12\text{cm}$

$BC = 8\text{ cm}$

The perpendicular distance of the line  $DC$  from the line  $AB$  is  $7\text{ cm}$ .

(a) Work out the area of the parallelogram.

.....  $\text{cm}^2$   
(2)

(b) Work out the perpendicular distance of the line  $AD$  from the line  $BC$ .

.....  $\text{cm}$   
(2)

(Total 4 marks)

Q11



12.

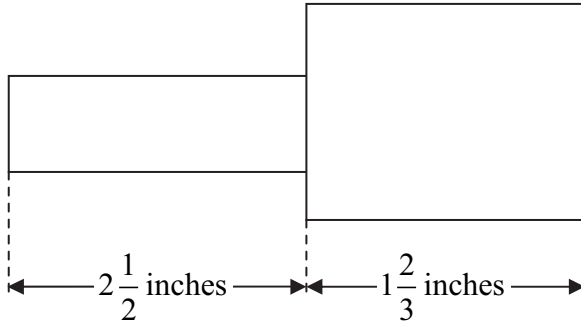


Diagram **NOT** accurately drawn

Work out the total length of the shape.

Give your answer as a mixed number.

..... inches

**(Total 3 marks)**

**Q12**



13. Fred carried out a survey of 100 students to see how long,  $T$  seconds, each student took to solve a problem.

The table gives information about these times.

Time $T$ seconds	Frequency	
$0 < T \leq 20$	30	
$20 < T \leq 40$	24	
$40 < T \leq 60$	40	
$60 < T \leq 80$	6	

Work out an estimate for the mean time taken to solve the problem.

..... seconds

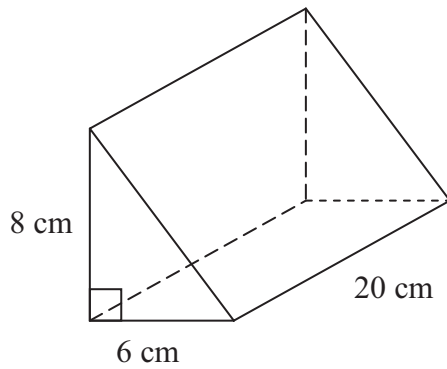
**(Total 4 marks)**

**Q13**



14.

Diagram NOT accurately drawn



The diagram shows a solid prism.  
 The cross-section of the solid prism is a right angle triangle.  
 The triangle has a base of 6 cm and a height of 8 cm.  
 The length of the solid prism is 20 cm.

(a) Work out the volume of the solid prism.

..... cm<sup>3</sup>  
**(2)**

The solid prism is made of metal.  
 The mass of 1 cm<sup>3</sup> of metal is 6 grams.

(b) Work out the total mass of the solid prism.

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

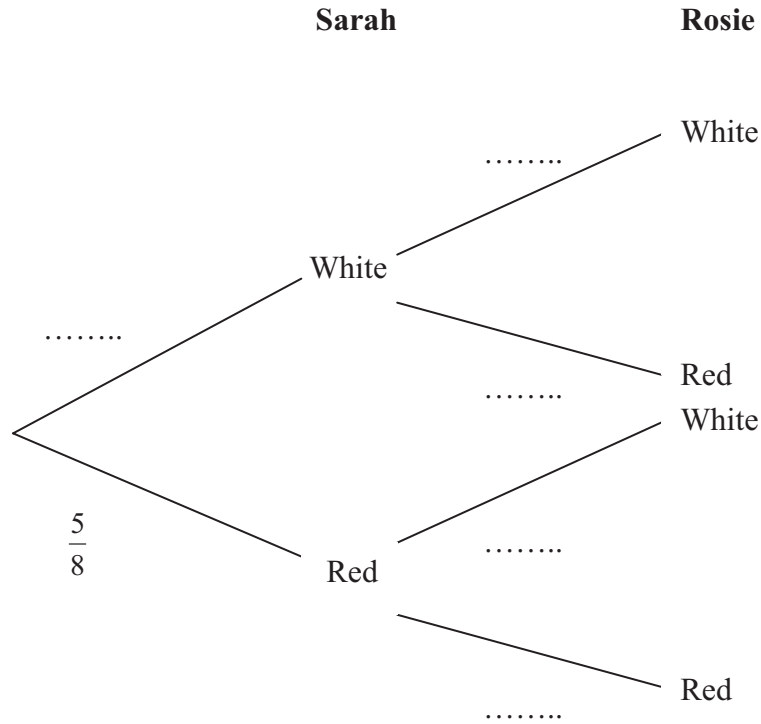
**(Total 4 marks)**

**Q14**



15. A bag contains 5 red counters and 3 white counters. Sarah takes a counter at random from the bag. She notes its colour and replaces it. Rosie then takes a counter at random from the bag.

(a) Complete the probability tree diagram shown below.



(2)

(b) Work out the probability that both Sarah and Rosie take a red counter.

.....  
(2)

(c) Work out the probability that only one of the counters taken is red.

.....  
(3)



Sarah takes at random a counter from the bag.  
 Sarah **does not** replace the counter.

(d) What then is the probability that the counter that Rosie takes will be red?

.....  
 (2)

**(Total 9 marks)**

**Q15**

**16.** (a) Write  $6 \times 10^5$  as an ordinary number.

.....  
 (1)

(b) Work out  $(6 \times 10^5)^2$

Give your answer in standard form.

.....  
 (2)

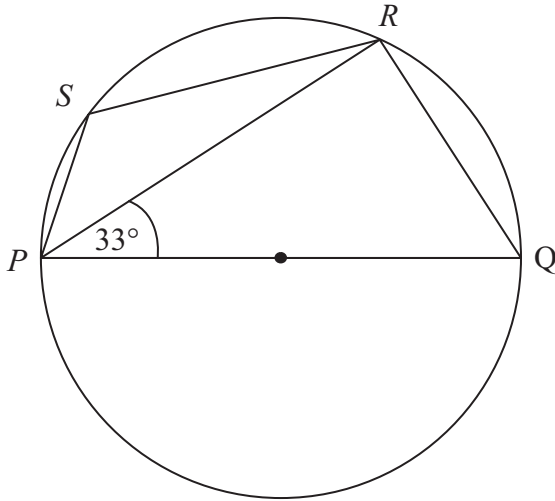
**(Total 3 marks)**

**Q16**



17.

Diagram NOT accurately drawn



$P, Q, R$  and  $S$  are points on the circle.  
 $PQ$  is a diameter of the circle.  
 Angle  $RPQ = 33^\circ$

(a) (i) Work out the size of angle  $PQR$ .

.....<sup>o</sup>

(ii) Give reasons for your answer.

.....  
 .....

(3)

(b) (i) Work out the size of angle  $PSR$ .

.....<sup>o</sup>

(ii) Give a reason for your answer.

.....

(2)

(Total 5 marks)

Q17





18. (i) Factorise  $x^2 + 5x + 4$

.....  
(2)

(ii) Solve  $x^2 + 5x + 4 = 0$

.....  
(1)

**(Total 3 marks)**

**Q18**

19. (a) Write down the gradient of the straight line with equation  $y = 2x + 3$

.....  
(1)

The line cuts the  $y$ -axis at the point  $A$ .

(b) Write down the coordinates of the point  $A$ .

(..... , .....)  
(1)

The line cuts the  $x$ -axis at the point  $B$ .

(c) Find the coordinates of the point  $B$ .

(..... , .....)  
(2)

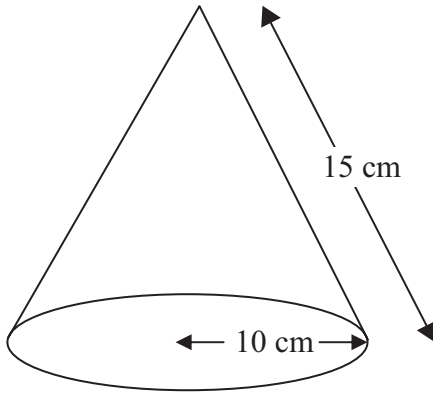
**(Total 4 marks)**

**Q19**



20.

Diagram **NOT** accurately drawn



The diagram shows a cone.  
 The radius of the base of the cone is 10 cm.  
 The slant height of the cone is 15 cm.

(a) Work out the total surface area of the cone. Give your answer as a multiple of  $\pi$ .

.....  $\text{cm}^2$   
**(3)**

A second cone has a surface area which is 64 times the surface area of the cone in part (a).  
 The two cones are similar.

(b) Work out the radius of the base of the second cone.

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

**(Total 5 marks)**

**Q20**



21.

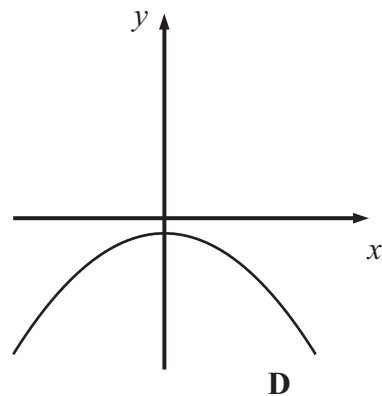
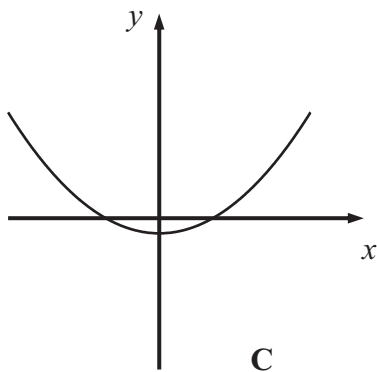
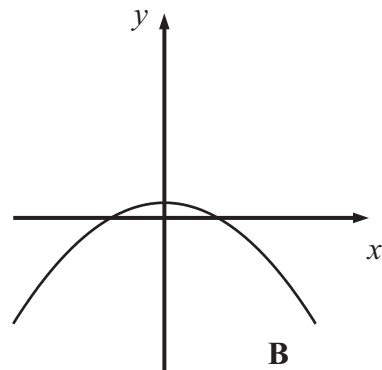
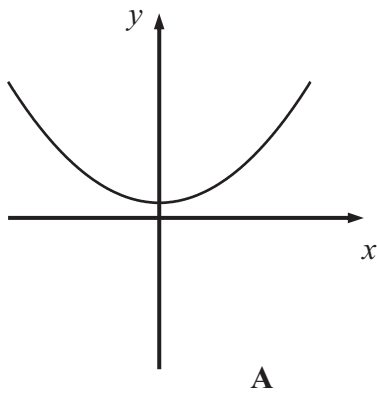
$$y = b - ax^2$$

(a) Rearrange the formula to make  $x$  the subject.

$$x = \dots\dots\dots (2)$$

$a > 0$  and  $b > 0$

(b) Write down the letter of the sketch which is the graph of  $y = b - ax^2$



.....  
(1)

**(Total 3 marks)**

**Q21**



22.

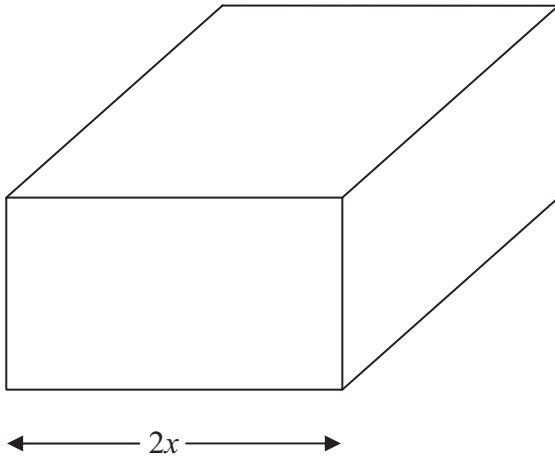


Diagram **NOT** accurately drawn

The diagram shows a cuboid.  
All the measurements of the cuboid are in centimetres.

The width of the cuboid is  $2x$  cm.  
The height of the cuboid is 2 cm less than the width.  
The length of the cuboid is 1 cm more than the width.

Find an expression in terms of  $x$  for the total surface area of the cuboid.  
Give your answer in its simplest form.

.....

(Total 4 marks)

Q22



23. (a) Write down the value of

(i)  $6^0$

.....

(ii)  $3^{-2}$

.....

(iii)  $8^{\frac{1}{3}}$

.....

(3)

(b) Rationalise the denominator and simplify  $\frac{8}{\sqrt{2}}$

.....

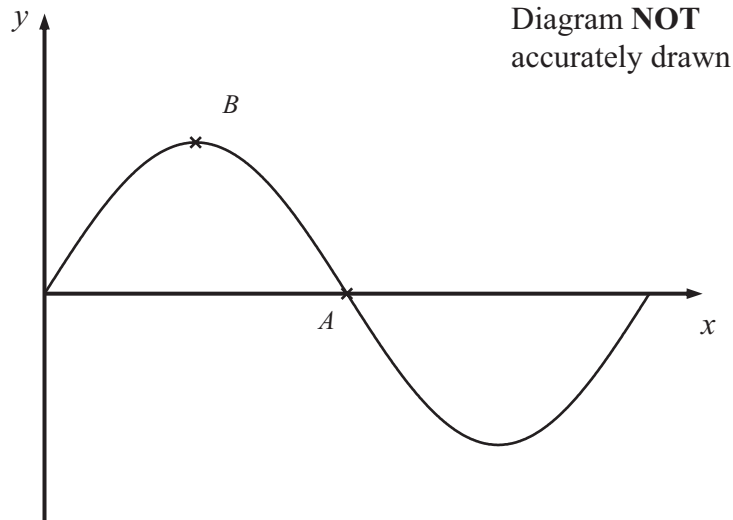
(3)

(Total 6 marks)

Q23



24.



The graph of  $y = 2 \sin x^\circ$ , for values of  $x$  from 0 to 360, is shown sketched above.

The curve cuts the  $x$  axis at the point  $A$ .  
The graph has a maximum at the point  $B$ .

(a) (i) Write down the coordinates of  $A$ .

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

(ii) Write down the coordinates of  $B$ .

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

**(2)**

(b) On the same diagram, sketch the graph of  $y = 2 \sin x^\circ + 1$  for values of  $x$  between 0 and 360

**(1)**

**(Total 3 marks)**

**Q24**



25. (a) Simplify

$$\frac{6y^2 - 5y - 6}{9y^2 - 4}$$

.....  
(2)

(b) Write the expression  $6(x + 2)^2 - 5(x + 2) - 6$

in the form  $(px + q)(rx + t)$  where  $p, q, r$  and  $t$  are integers.

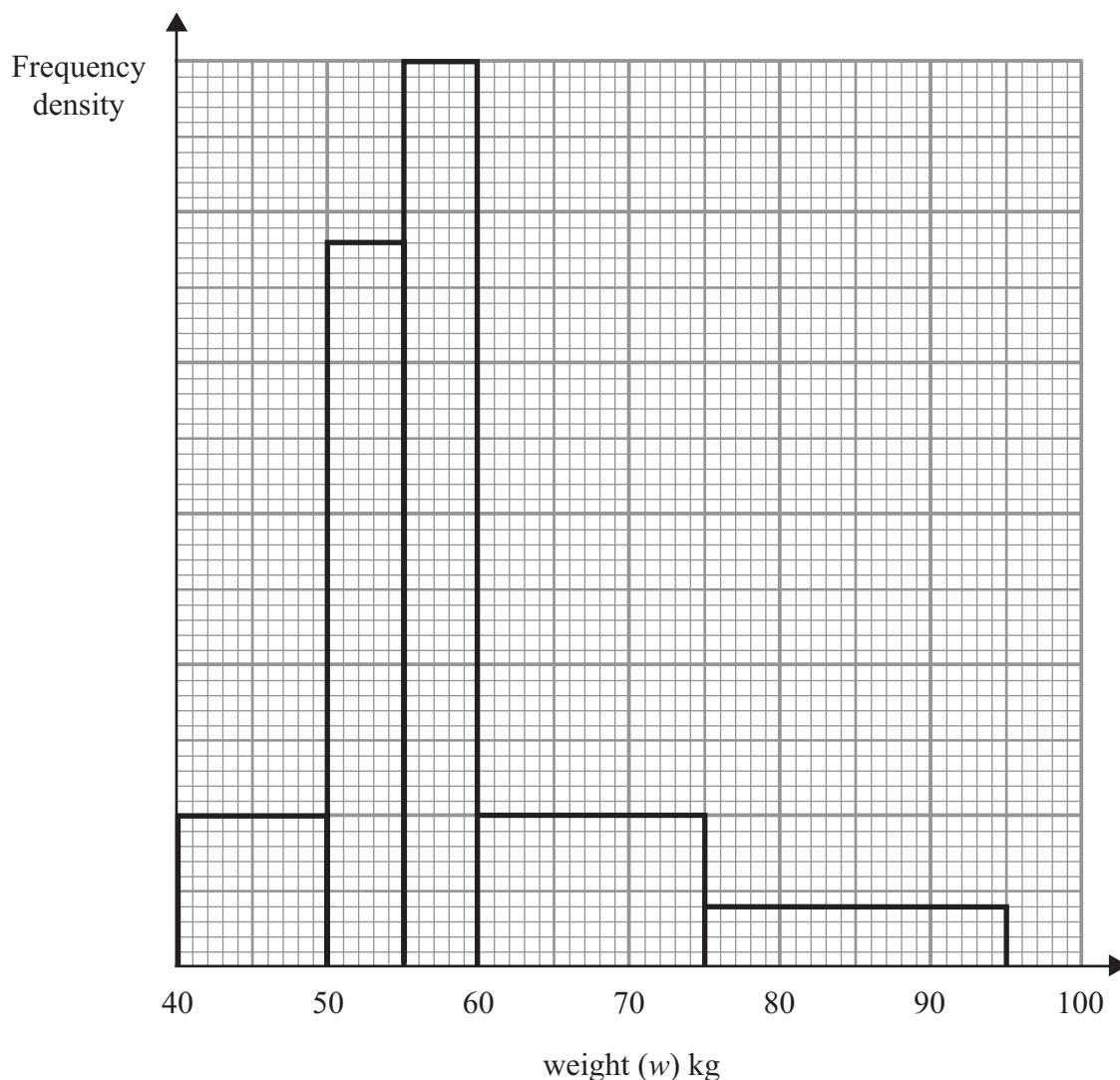
.....  
(2)

**(Total 4 marks)**

**Q25**



26. The incomplete table and histogram give some information about the weights of people at a keep-fit session.



Use the information in the histogram to complete the frequency table.

Weight ( $w$ ) kg	Frequency
$40 \leq w < 50$	10
$50 \leq w < 55$	
$55 \leq w < 60$	
$60 \leq w < 75$	15
$75 \leq w < 95$	8

(Total 2 marks)

TOTAL FOR PAPER: 100 MARKS

END

Q26

