

FORM 4

MATHEMATICS SCHEME B
Non Calculator Paper

TIME: 20 minutes

Name: _____

Class: _____

Instructions to Candidates

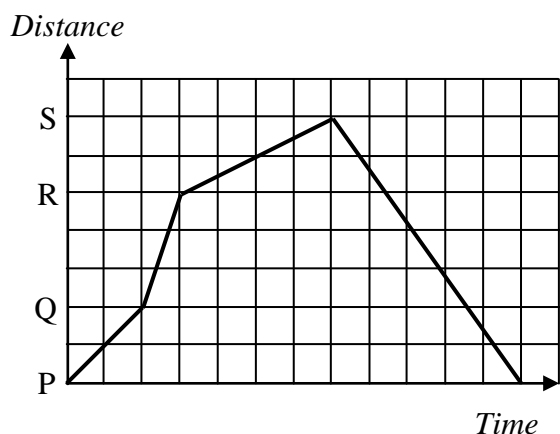
- **Answer all questions.**
 - **This paper carries a total of 20 marks.**
 - **Calculators and protractors are NOT ALLOWED.**
-

No.	Question	Space for working if required
1	Write 0.000 004 32 in standard form . Ans: _____	
2	Write 0.28 as a fraction in its simplest form . Ans: _____	
3	Work out: $3^2 + 4^3 - 5^0$ Ans: _____	
4	A map scale is given as 1 : 50 000. What is the actual distance in kilometres which is represented by 18 cm on the map? Ans: _____ km	
5	A machine fills 640 bottles in 4 minutes. How many bottles will it fill in 30 seconds? Ans: _____	
6	Simplify: $\frac{k^3 \times k^8}{k^5}$ Ans: _____	
7	How many $2\frac{1}{4}$'s are there in $13\frac{1}{2}$? Ans: _____	

Name _____

Class _____

8



This travel graph shows a journey from P to S and back to P. Which of the following shows the **highest speed**?

- (A) P to Q (B) Q to R (C) R to S (D) S to P

Ans: _____

9

A car service bill amounted to €273. The ratio of the cost of parts to the cost of labour was 3:4. What was the labour cost?

Ans: _____

10

A shape T is **similar but not congruent** to Shape T_1 . Which is the correct transformation of shape T to shape T_1 ?

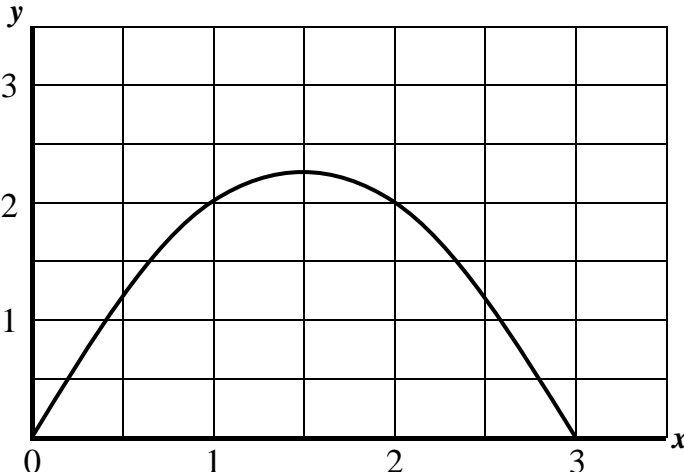
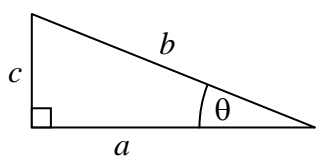
- (A) Translation
 (B) Rotation
 (C) Reflection
 (D) Enlargement by scale factor 2

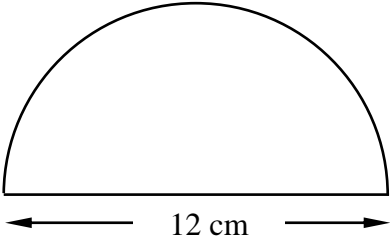
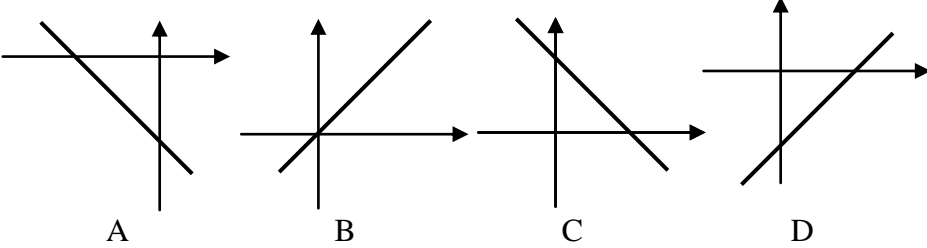
Ans: _____

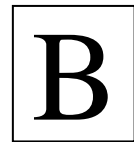
11

What is the **Least Common Multiple** of 5, 10 and 8?

Ans: _____

12	<p>The diagram shows the graph of $y = 3x - x^2$</p>  <p>The maximum value of y is: (A) 0 (B) 1.5 (C) 2.25 (D) 3</p> <p style="text-align: right;">Ans: _____</p>	
13	<p>Work out: $6\frac{1}{3} - 1\frac{2}{5} + 1\frac{8}{15}$</p> <p style="text-align: right;">Ans: _____</p>	
14	<p>Which of the following is false?</p> <p>(A) $c = b \sin \theta$ (B) $a = b \cos \theta$ (C) $a = c \tan \theta$ (D) $c = a \tan \theta$</p>  <p style="text-align: right;">Ans: _____</p>	
15	<p>Leonard read from page 19 to page 99. How many pages did he read?</p> <p style="text-align: right;">Ans: _____</p>	

16	<p>Estimate the Perimeter of a semicircle of diameter 12 cm. (Take $\pi = 3$.)</p>  <p style="text-align: right;">Ans: _____ cm</p>	
17	<p>One of the following is the graph of $y = x - 5$. Which one is it?</p>  <p style="text-align: right;">Ans: _____</p>	
18	<p>Two coins are tossed. What is the probability that they both land Tails?</p> <p style="text-align: right;">Ans: _____</p>	
19	<p>Estimate the value of $\left(\frac{10.34 \times 1.85}{4.92}\right)^{2.05}$</p> <p style="text-align: right;">Ans: _____</p>	
20	<p>The mode of four numbers is 5. The smallest is 3 and the range is 8. What is the mean of these four numbers?</p> <p style="text-align: right;">Ans: _____</p>	



FORM 4

MATHEMATICS SCHEME B
Main Paper

TIME: 1h 40min

Question	1	2	3	4	5	6	7	8	9	10	11	Total Main	Non Calc	Global Mark
Mark														

DO NOT WRITE ABOVE THIS LINE

Name: _____

Class: _____

CALCULATORS ARE ALLOWED BUT ALL NECESSARY WORKING MUST BE SHOWN. ANSWER ALL QUESTIONS.

1. Is the triangle with sides 11 cm, 60 cm and 61 cm a **right-angled triangle**? **Show your working.**

Ans: _____

(4 marks)

2. (a) Expand and simplify: $3(4 - 2x) + 5(3x - 1)$

Ans: _____

(b) Factorise completely: $21p + 7p^2$

Ans: _____

(c) Simplify: $\frac{x}{2} + \frac{x+5}{4}$

Ans: _____

(d) Solve the equation: $4y + 2(y - 1) = 5y$

Ans: $y =$ _____

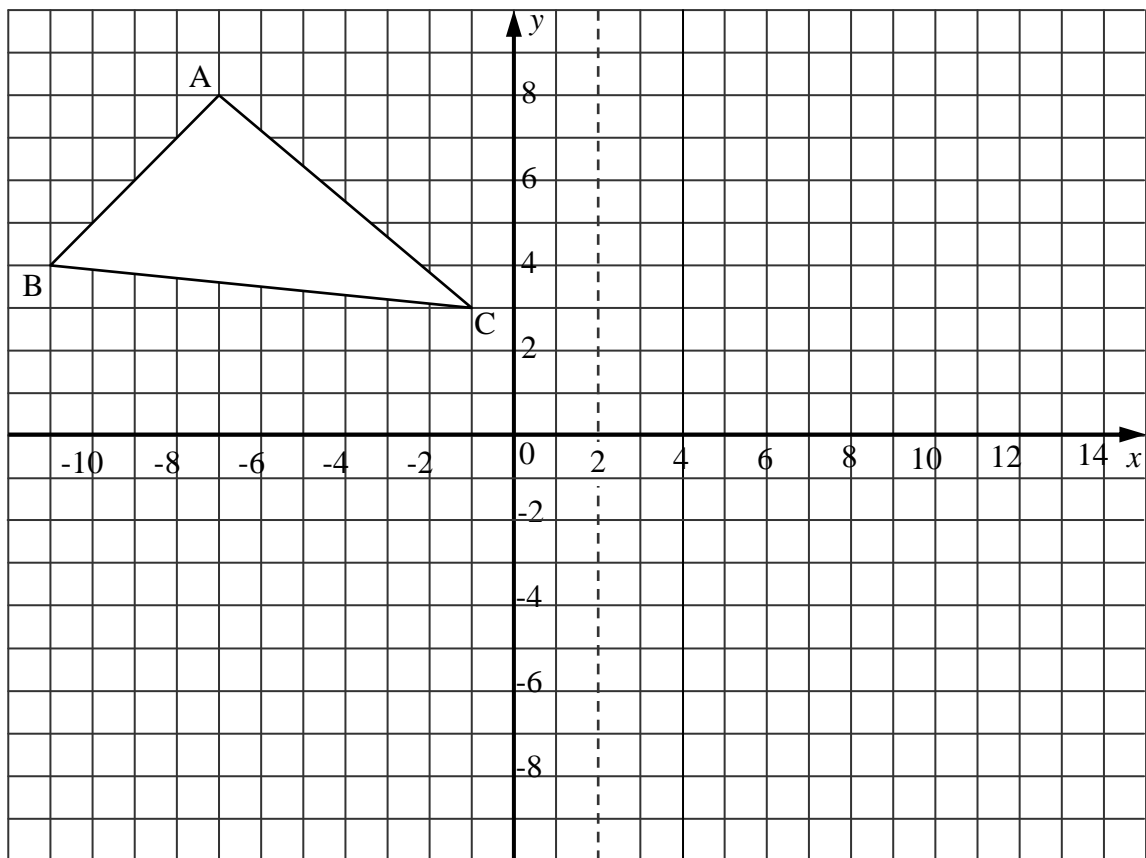
_____ (7 marks)

Name _____

Class _____

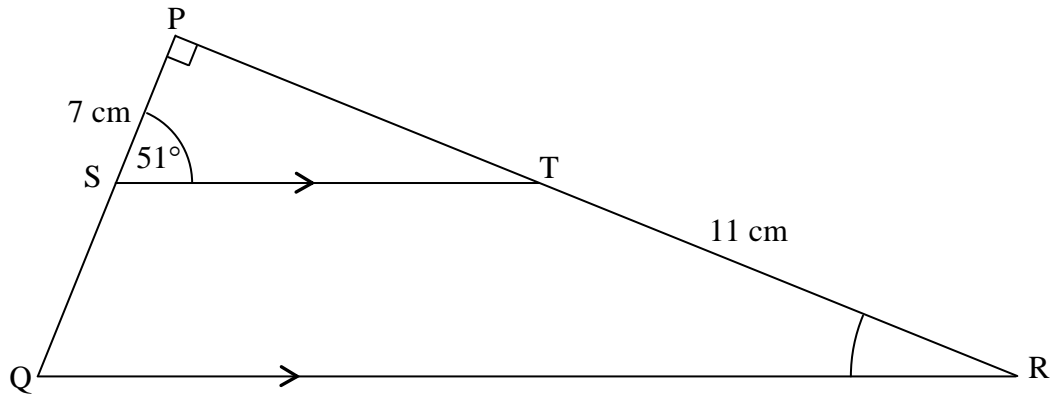
3. (a) **Draw and label the reflection** of triangle ABC in the line $x = 2$, to form triangle $A_1 B_1 C_1$.

(b) **Draw and label the rotation** of triangle ABC 180° about the origin to form triangle $A_2 B_2 C_2$.



(8 marks)

4.



PQR is a right-angled triangle. QR and ST are parallel. PS = 7 cm, TR = 11 cm and angle PST = 51° .

(a) Calculate the length PT, correct to 3 decimal places.

Ans: PT = _____ cm

(b) Calculate angle PRQ.

Ans: angle PRQ = _____^o

(c) Calculate the length QR. Give your answer correct to the nearest mm.

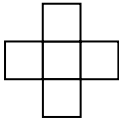
Ans: QR = _____ cm

(6 marks)

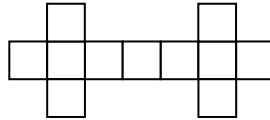
Name _____

Class _____

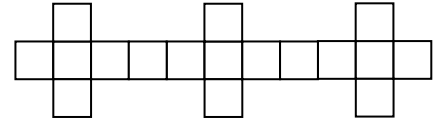
5. Clive is designing a pattern. Each section of the pattern is made of squares as shown below.



1 section
5 squares



2 sections
11 squares



3 sections

(a) Complete the table:

Number of Sections (s)	1	2	3	4
Number of squares (r)	5	11		

(b) Write down a formula for the number of squares r in terms of the number of sections s .

Ans: $r =$ _____

(c) Clive used 143 squares. **How many sections** did he make?

Ans: _____ sections

(7 marks)

6. A plane travelling at constant speed travels 1350 km in 2 hours 15 minutes.
(a) What is the **speed** of the plane in km/h?

Ans: _____ km/h

- (b) **How far**, in km, will it fly in $\frac{1}{4}$ hour?

Ans: _____ km

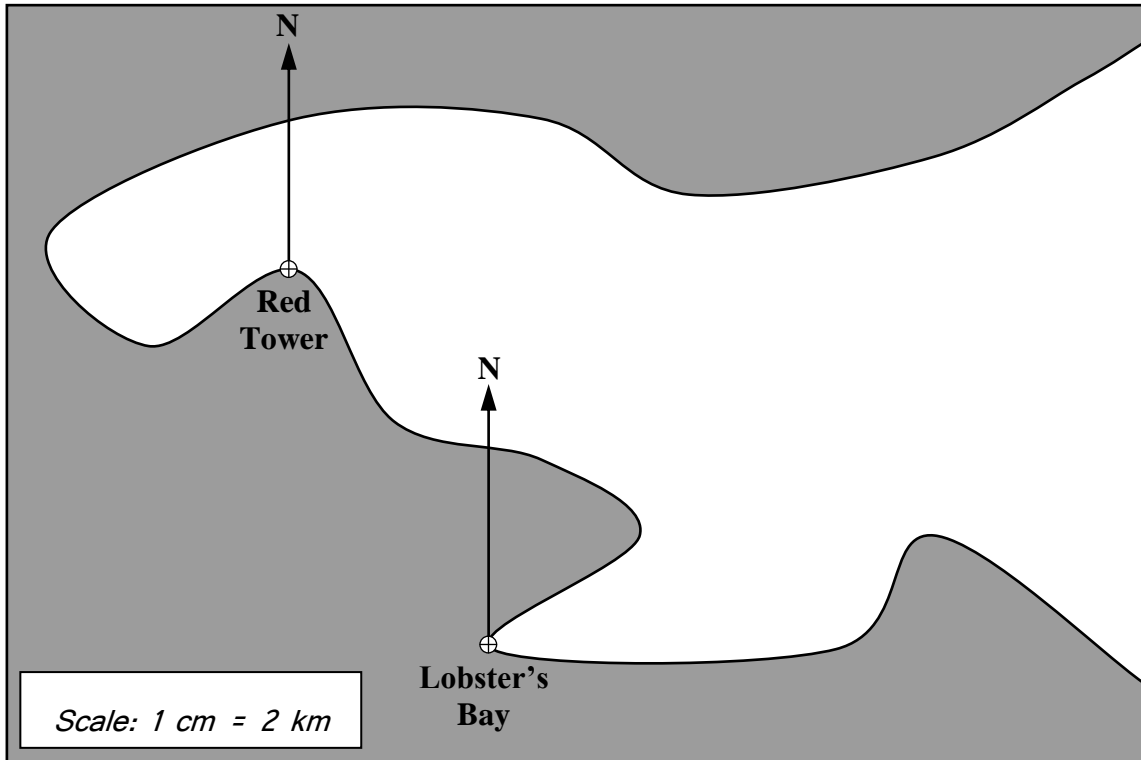
- (c) **How long**, in minutes, will it take to travel 1000 km?

Ans: _____ minutes

(8 marks)

7. An offshore wind farm is on a bearing of 100° and at a distance of 22 km from the Red Tower.

(a) Show **the exact** position of the wind farm on the map below. Label the wind farm X.



(b) Measure the **bearing** of the wind farm from Lobster's Bay.

Ans: _____

(c) What is the **actual distance** between the Red Tower and Lobster's Bay?
Give your answer in km correct to 1 decimal place.

Ans: _____ km

(6 marks)

8. A survey was conducted among a group of students. They were asked the amount of time they have spent doing their homework the day before. The results are shown in the frequency table below.

Time (t minutes)	Frequency
$0 < t \leq 30$	12
$30 < t \leq 60$	15
$60 < t \leq 90$	20
$90 < t \leq 120$	18
$120 < t \leq 150$	13

- (a) Draw a histogram to illustrate this data.

- (b) How many students took part in the survey?

Ans: _____

- (c) How many students took **more than 1½ hours** to do their homework?

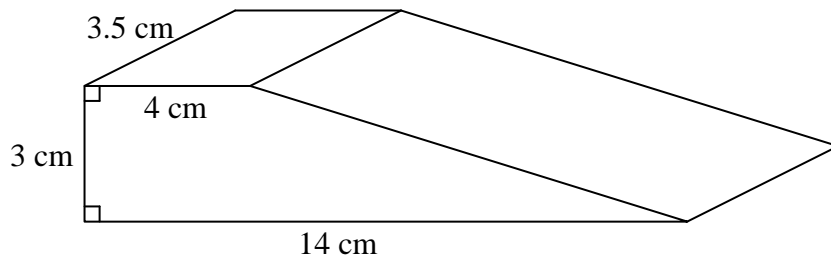
Ans: _____

- (d) What is the **probability** that the first student that was asked took **1 hour or less** to do his or her homework?

Ans: _____

(8 marks)

9. The wooden door wedge, shown below, has a cross section which is a trapezium.



(a) Calculate the area of the cross section.

Ans: _____ cm^2

(b) Calculate the volume of the prism.

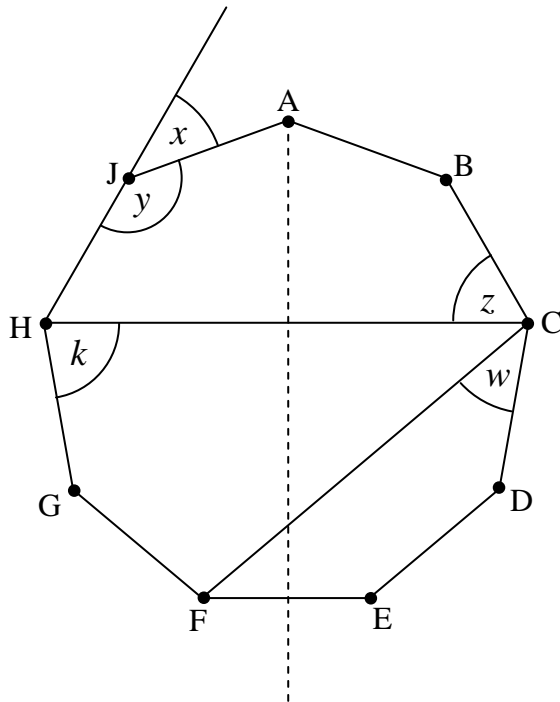
Ans: _____ cm^3

(c) If the wedge is cut from a cuboid measuring 14 cm by 3.5 cm by 3 cm, what volume of wood will be wasted?

Ans: _____ cm^3

(7 marks)

10. ABCDEFGHJ is a **regular nonagon** where the dotted line through A is a line of symmetry. HC and FC are straight lines and x is an external angle. Calculate the angles marked x , y , z , k and w . **Show all your working.**



Ans: $x =$ _____ °

Ans: $y =$ _____ °

Ans: $z =$ _____ °

Ans: $k =$ _____ °

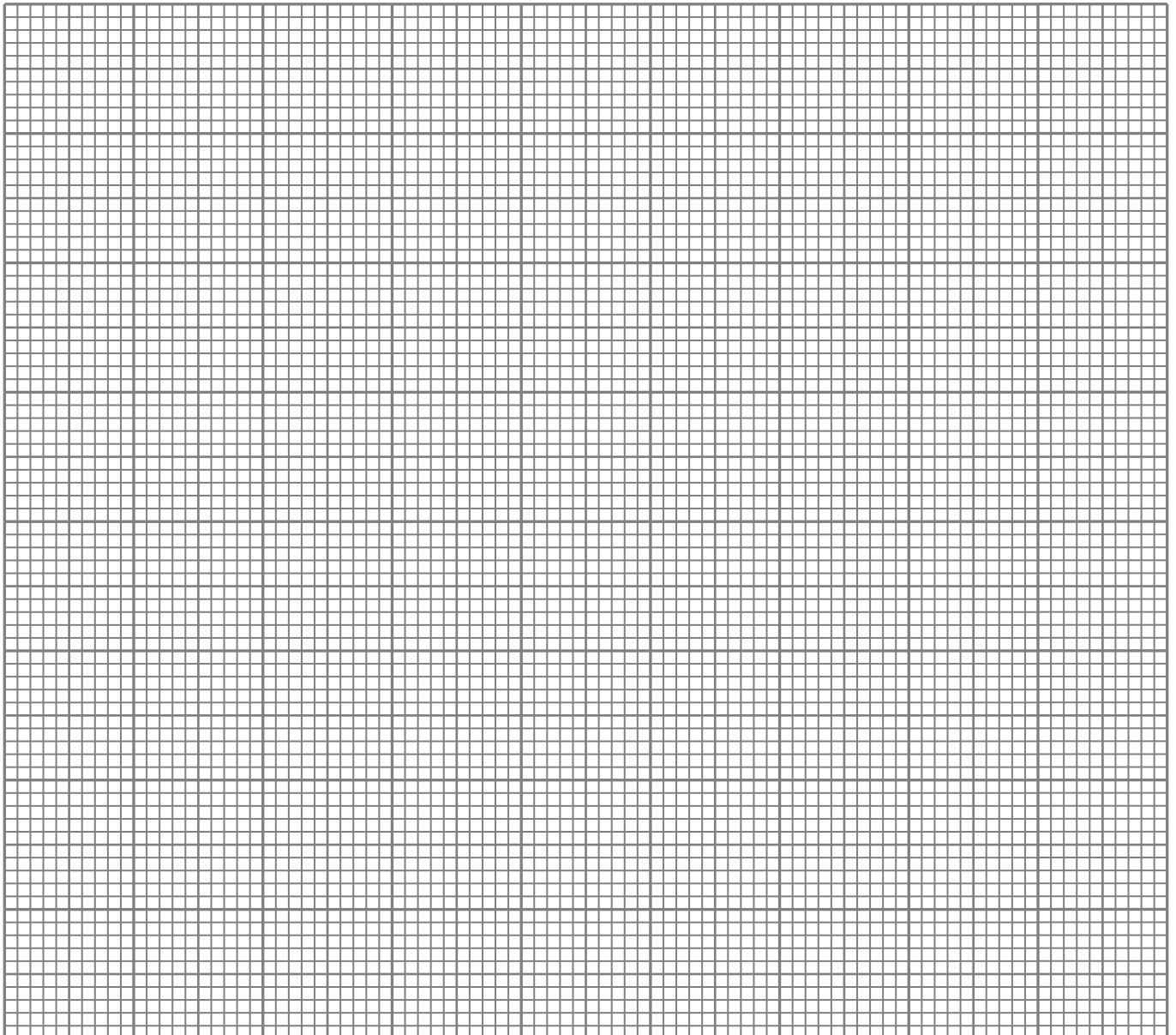
Ans: $w =$ _____ °

(10 marks)

11. (a) Complete the table of values for $y = 2x^2 - 5$.

x	-2	-1.5	-1	-0.5	0	0.5	1	1.5	2
$2x^2$	8	4.5	2			0.5			8
-5		-5			-5				-5
y		-0.5	-3	-4.5					3

- (b) **Draw and label** a pair of axes taking $-2 \leq x \leq 2$ and $-5 \leq y \leq 3$. Use 4 cm for every unit on the x axis and 2 cm for every unit on the y axis.



- (c) Draw the graph of $y = 2x^2 - 5$.
 (d) Use your graph to find the values of x when $y = -2$, correct to 1 decimal place.

Ans: $x = \underline{\hspace{1cm}}, \underline{\hspace{1cm}}$

(9 marks)

END OF PAPER