

FORM 4

MATHEMATICS SCHEME B
Non Calculator Paper

TIME: 20 minutes

Name: _____

Class: _____

Instructions to Candidates

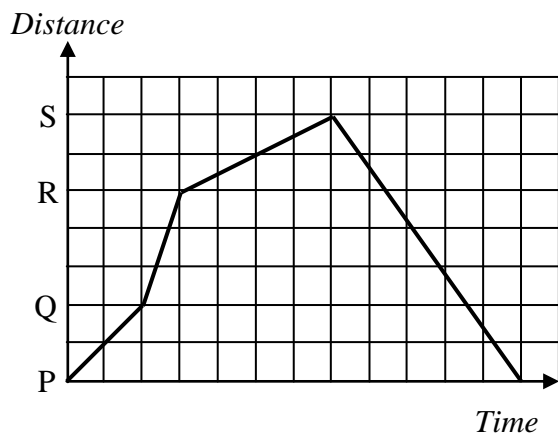
- **Answer all questions.**
 - **This paper carries a total of 20 marks.**
 - **Calculators and protractors are NOT ALLOWED.**
-

No.	Question	Space for work 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 _____

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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

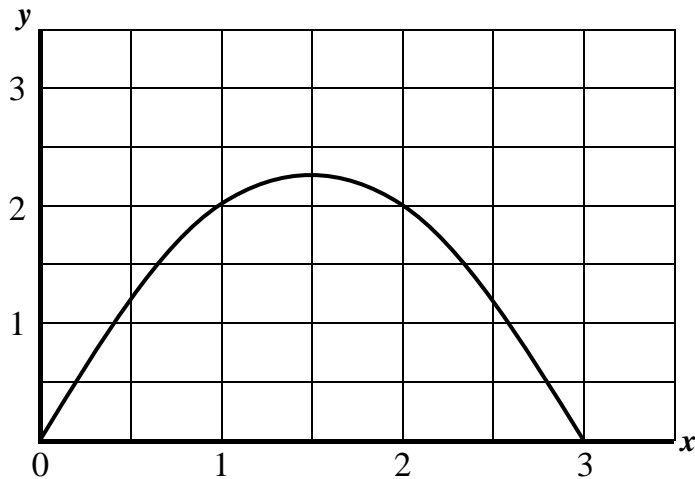
Ans: _____

11

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

Ans: _____

- 12 The diagram shows the graph of $y = 3x - x^2$



The **maximum** value of y is:

- (A) 0 (B) 1.5 (C) 2.25 (D) 3

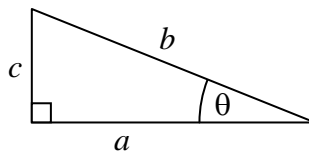
Ans: _____

- 13 Work out: $6\frac{1}{3} - 1\frac{2}{5} + 1\frac{8}{15}$

Ans: _____

- 14 Which of the following is **false**?

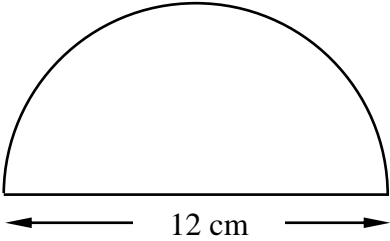
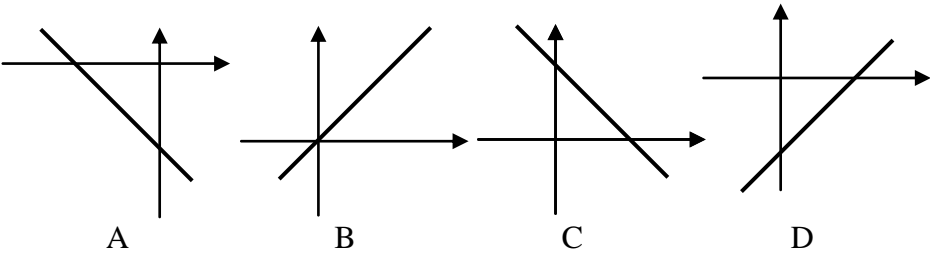
- (A) $c = b \sin \theta$
 (B) $a = b \cos \theta$
 (C) $a = c \tan \theta$
 (D) $c = a \tan \theta$



Ans: _____

- 15 Leonard read from page 19 to page 99. How many pages did he read?

Ans: _____

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

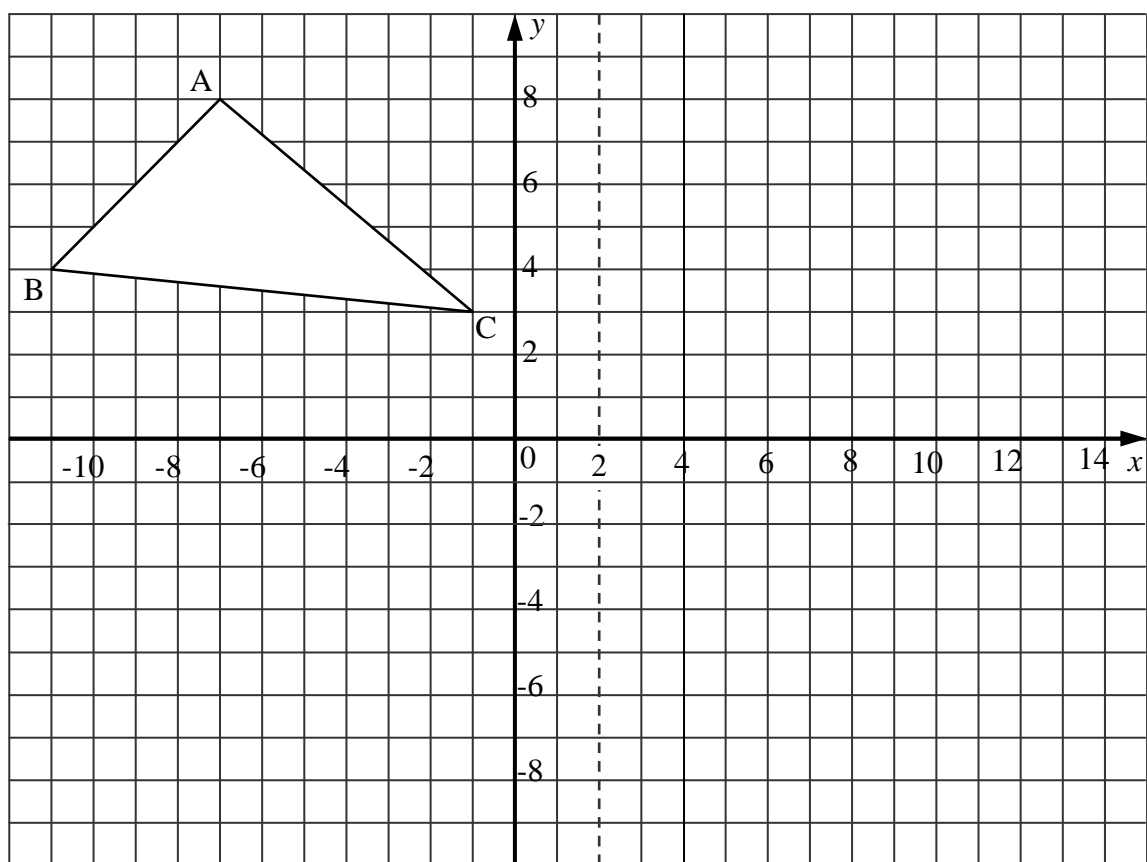
(7 marks)

Name _____

Class _____

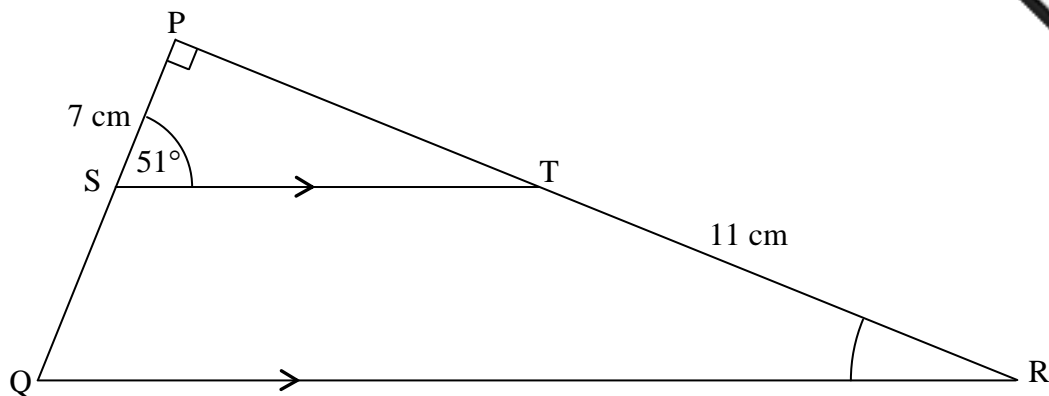
3. (a) **Draw** and **label** the **reflection** of triangle ABC in the line $x = 2$, to form triangle $A_1 B_1 C_1$.

(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 = _____ $^\circ$

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

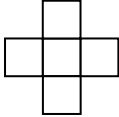
Ans: QR = _____ cm

(6 marks)

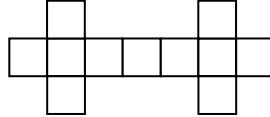
Name _____

Class _____

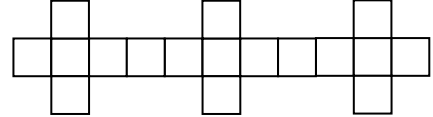
5. Clive is designing a pattern. Each section of the pattern is made of squares as shown below.



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

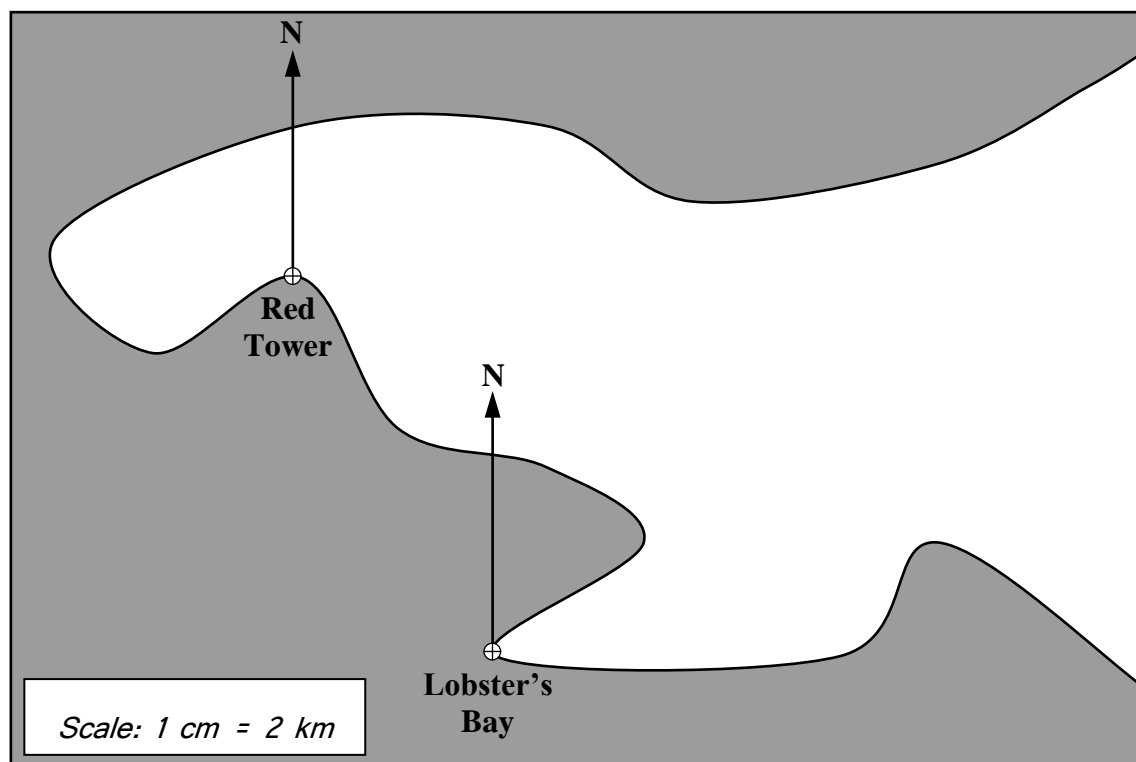
- (c) **How long**, in minutes, will it take to travel 1000 km?

Ans:_____ minutes

(8 marks)

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

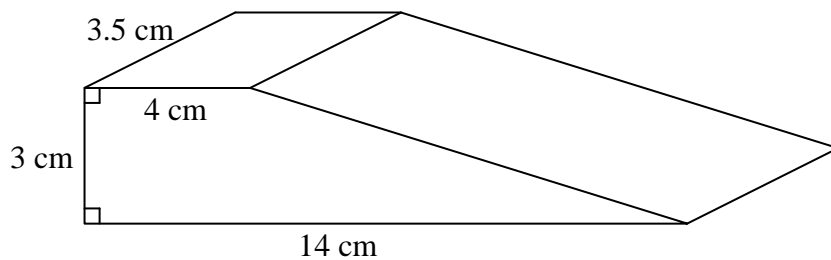
Ans: _____

- (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.

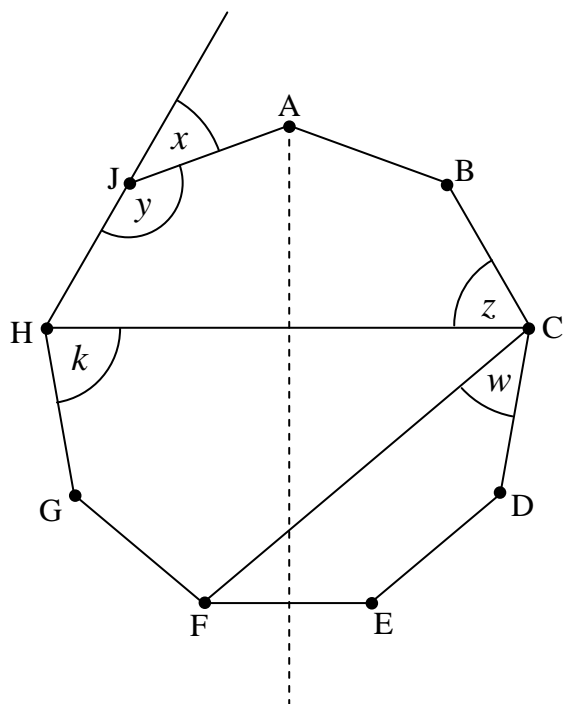
Ans: _____ cm^3

- (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 values of the angles marked x , y , z , k and w . **Show all your working.**



Ans: $x =$ _____

Ans: $y =$ _____

Ans: $z =$ _____

Ans: $k =$ _____

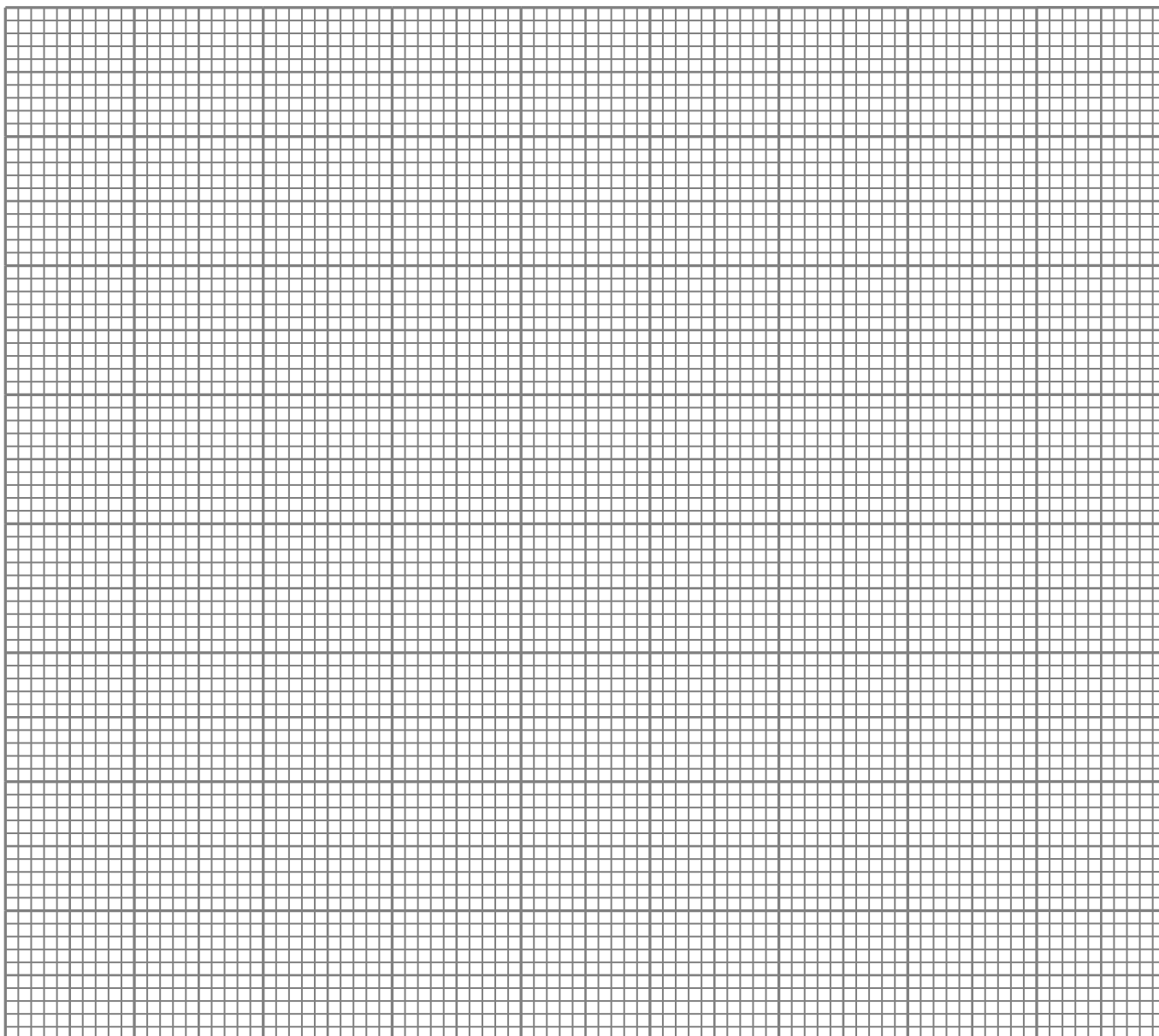
Ans: $w =$ _____

(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	
$2x^2$	8	4.5	2			0.5		
-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