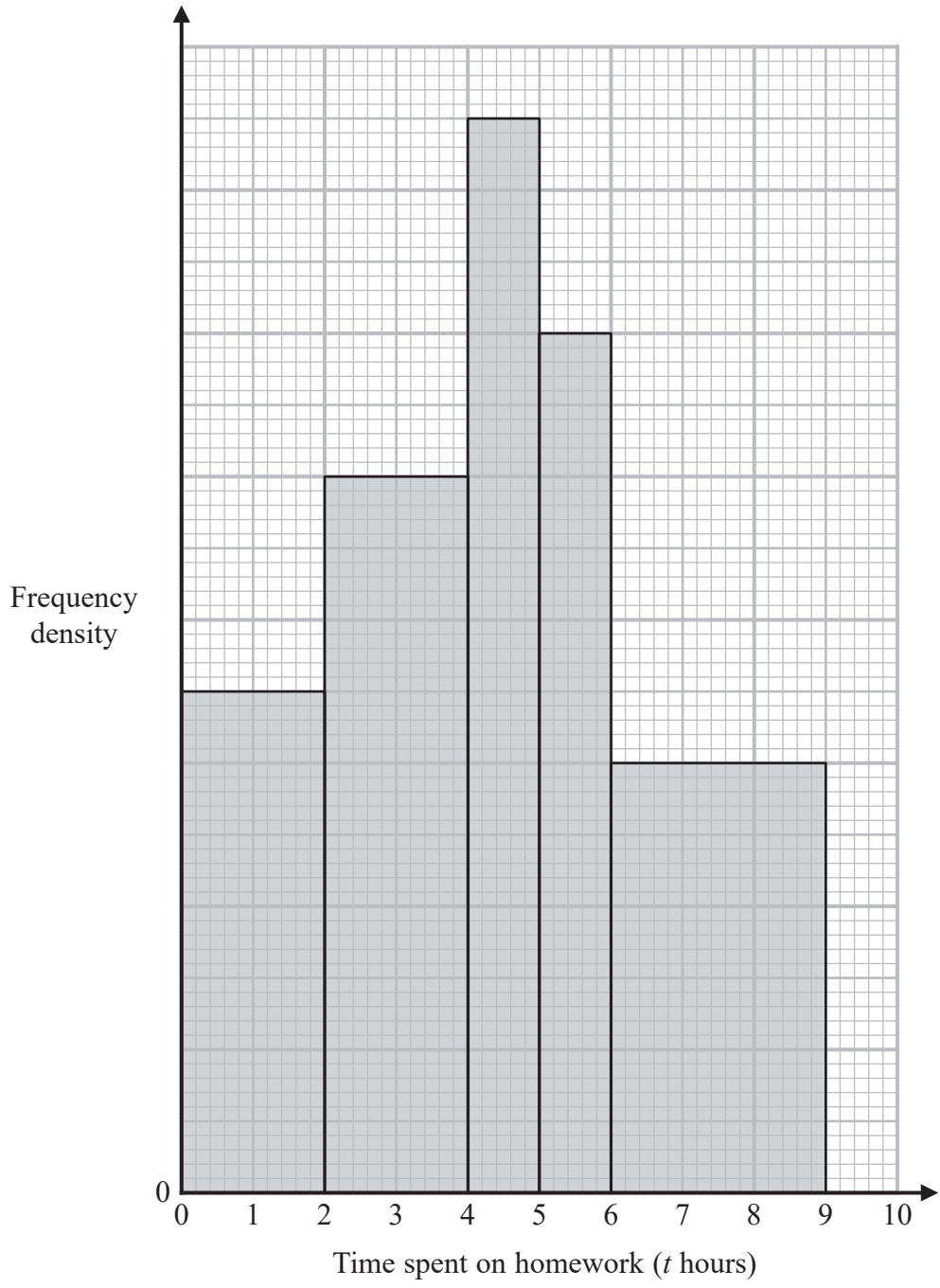


18 The histogram and the table give some information about the amounts of time, in hours, that Year 11 students at Bergdesh Academy spent, in total, on their homework last week. No student in Year 11 spent longer than 9 hours on their homework.



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Time spent on homework (t hours)	Frequency
$0 < t \leq 2$	28
$2 < t \leq 4$	
$4 < t \leq 5$	
$5 < t \leq 6$	
$6 < t \leq 9$	

Using the information in the histogram and in the table, work out an estimate for the mean amount of time the Year 11 students spent on their homework last week. Give your answer in hours correct to 3 significant figures.

..... hours

(Total for Question 18 is 5 marks)

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19 $k = \frac{t}{a - h}$

- $t = 14$ correct to 2 significant figures
- $a = 7.8$ correct to 2 significant figures
- $h = 3.4$ correct to 2 significant figures

Work out the lower bound for the value of k .
Show your working clearly.

.....
(Total for Question 19 is 3 marks)



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20 A particle P is moving along a straight line.
The fixed point O lies on the line.

At time t seconds ($t \geq 0$), the displacement of P from O is s metres where

$$s = t^3 - 9t^2 + 33t - 6$$

Find the minimum speed of P .

..... m/s

(Total for Question 20 is 5 marks)



21 The n th term of an arithmetic series is u_n where $u_n > 0$ for all n
The sum to n terms of the series is S_n

Given that $u_4 = 6$ and that $S_{11} = (u_6)^2 + 18$

find the value of u_{20}

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(Total for Question 21 is 6 marks)

Turn over for Question 22



22 ABC is an isosceles triangle with $AB = AC$.

B is the point with coordinates $(-1, 5)$

C is the point with coordinates $(2, 10)$

M is the midpoint of BC .

Find an equation of the line through the points A and M .

Give your answer in the form $py + qx = r$ where p , q and r are integers.

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(Total for Question 22 is 5 marks)

TOTAL FOR PAPER IS 100 MARKS

