GCSE Grade 8/9

Maths Booklet 5

Paper 1H
Non-Calculator

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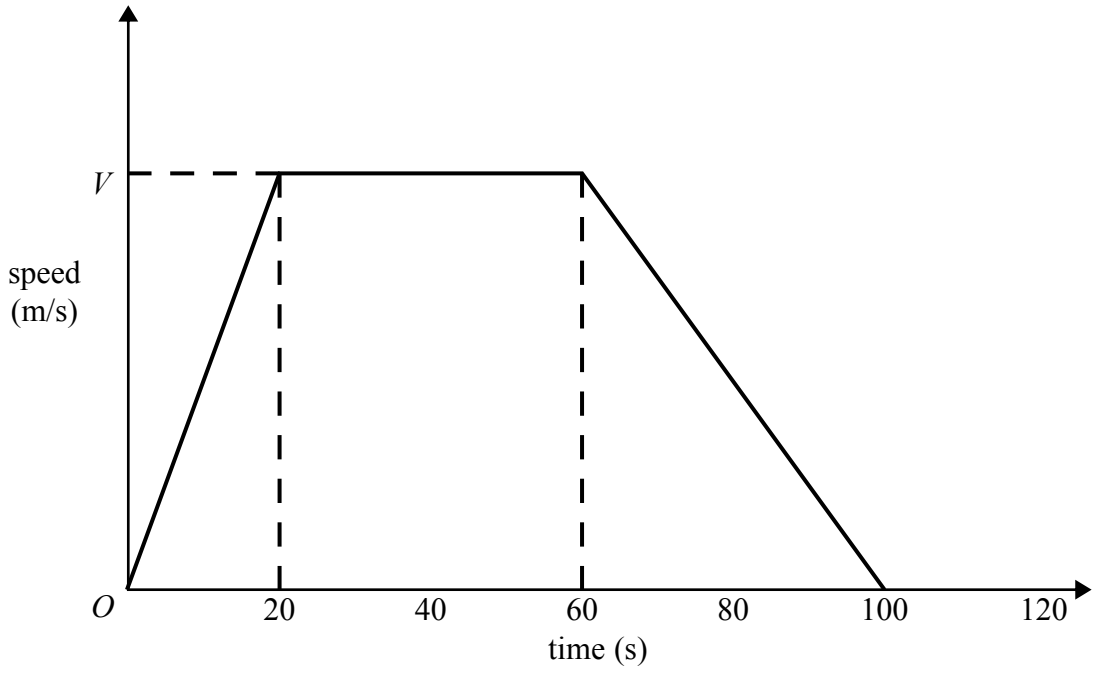
1 Find the coordinates of the turning point on the curve with equation $y = 9 + 18x - 3x^2$
You must show all your working.

(..... , ...)

(Total for Question 1 is 4 marks)

2 Here is a speed-time graph for a car journey.
The journey took 100 seconds.



The car travelled 1.75 km in the 100 seconds.

(a) Work out the value of V.

.....

(3)

(b) Describe the acceleration of the car for each part of this journey.

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.....

.....

(2)

(Total for Question 2 is 5 marks)

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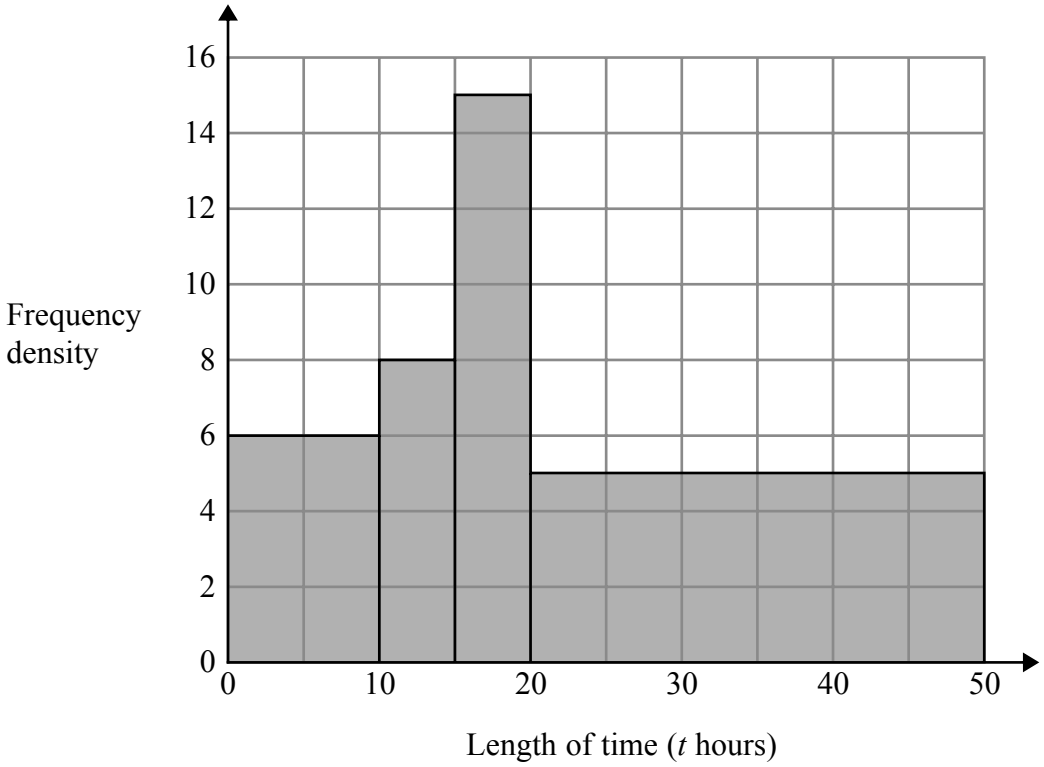
3 Bhavna recorded the lengths of time, in hours, that some adults watched TV last week.

The table shows information about her results.

Length of time (t hours)	Frequency
$0 \leqslant t < 10$	6
$10 \leqslant t < 15$	8
$15 \leqslant t < 20$	15
$20 \leqslant t < 40$	5

Bhavna made some mistakes when she drew a histogram for this information.



Write down **two** mistakes Bhavna made.

1 .....

.....

2 .....

.....

(Total for Question 3 is 2 marks)

4 Show that $\dfrac{1}{1+\dfrac{1}{\sqrt{2}}}$ can be written as $2-\sqrt{2}$

(Total for Question 4 is 3 marks)

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5 John has an empty box.
He puts some red counters and some blue counters into the box.

The ratio of the number of red counters to the number of blue counters is 1 : 4

Linda takes at random 2 counters from the box.

The probability that she takes 2 red counters is $\frac{6}{155}$

How many red counters did John put into the box?

.....

(Total for Question 5 is 4 marks)

6 $A(-2, 1)$, $B(6, 5)$ and $C(4, k)$ are the vertices of a right-angled triangle ABC.
Angle ABC is the right angle.

Find an equation of the line that passes through A and C.
Give your answer in the form $ay + bx = c$ where a, b and c are integers.

(Total for Question 6 is 5 marks)

7 Solve $x^2 - 6x - 8 = 0$

Write your answer in the form $a \pm \sqrt{b}$ where a and b are integers.

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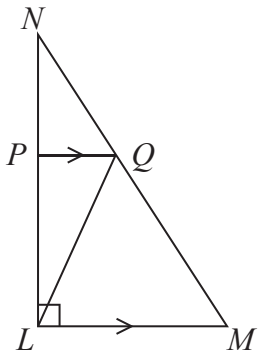
(Total for Question 7 is 3 marks)

8 LMN is a right-angled triangle.



Angle $NLM = 90°$
PQ is parallel to LM.

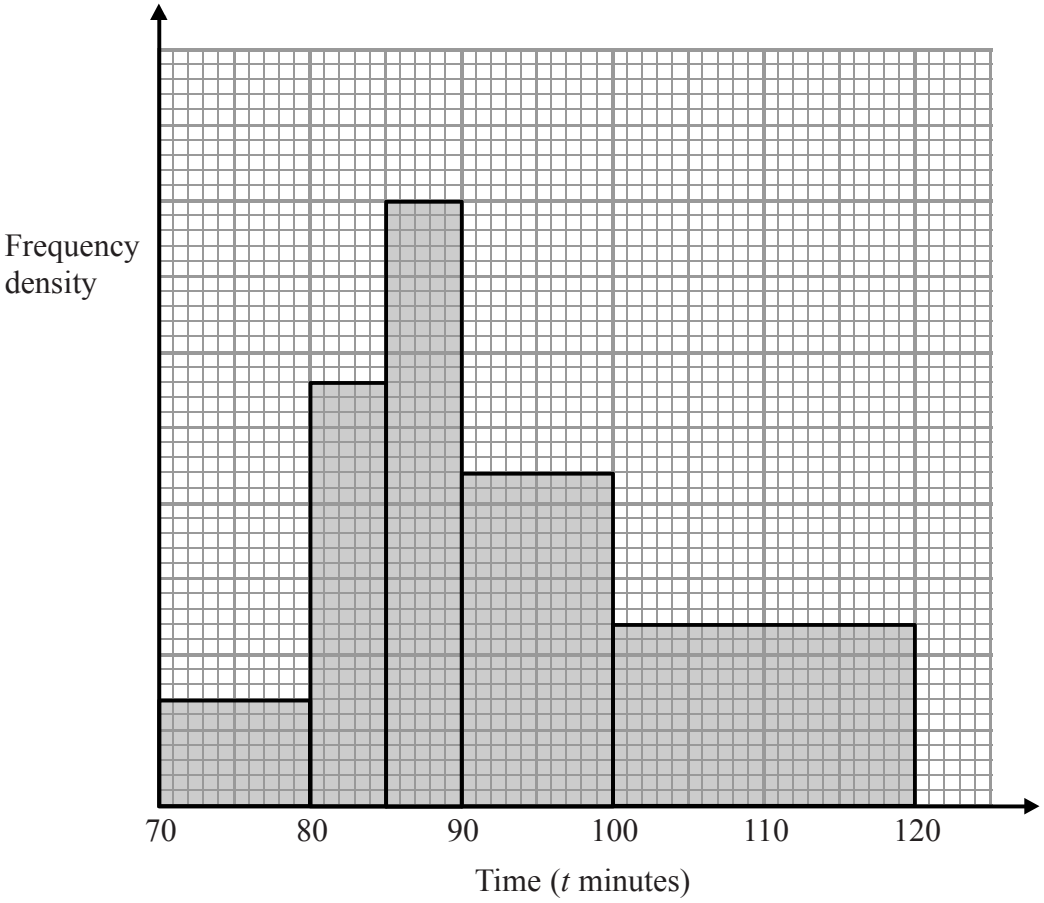
The area of triangle PNQ is 8 cm^2
The area of triangle LPQ is 16 cm^2

Work out the area of triangle LQM.

..... cm^2

(Total for Question 8 is 4 marks)

9 The histogram shows information about the time taken by cyclists to finish a cycle race.



7 cyclists took 80 minutes or less to finish the race.

(i) Work out an estimate for the number of cyclists who took more than 105 minutes to finish the race.

.....

(ii) Explain why your answer to part (i) is only an estimate.

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(Total for Question 9 is 4 marks)

10 Show that $\frac{3x+6}{x^2-3x-10} \div \frac{x+5}{x^3-25x}$ simplifies to ax where a is an integer.

(Total for Question 10 is 4 marks)

11 Solve the inequality $x^2 > 3(x + 6)$

(Total for Question 11 is 4 marks)