Mock Grade 8/9

Maths Booklet 5

Paper 1H
Non-Calculator

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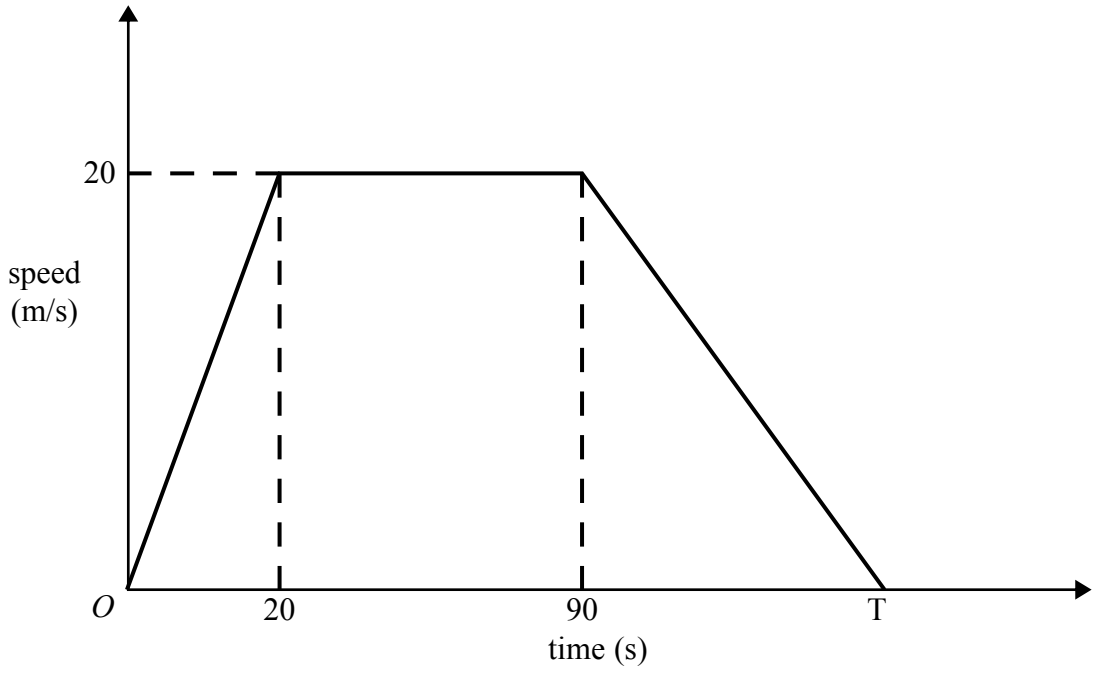
1 Find the coordinates of the turning point on the curve with equation $y = 10 + 12x - 3x^2$
You must show all your working.

(..... , ...)

(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 2 km in the T seconds.

(a) Work out the value of T.

.....

(3)

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

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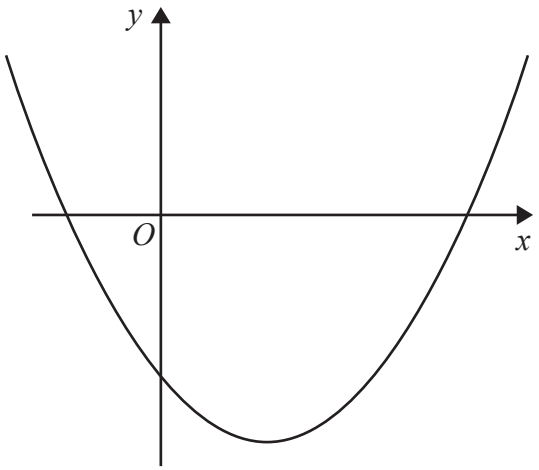
.....

(2)

(Total for Question 2 is 5 marks)

3 Here is a sketch of a curve.



The equation of the curve is $y = x^2 + ax + b$ where a and b are integers.

The points $(0, -48)$ and $(6, 0)$ lie on the curve.

Find the coordinates of the turning point of the curve.

(..... , ...)

(Total for Question 3 is 4 marks)

4 Show that $\dfrac{3}{1+\frac{1}{\sqrt{3}}}$ can be written as $\dfrac{9-3\sqrt{3}}{2}$

(Total for Question 4 is 3 marks)

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 3 : 5

Linda takes at random 2 counters from the box.

The probability that she takes 2 red counters is $\frac{21}{59}$

How many red counters did John put into the box?

.....

(Total for Question 5 is 4 marks)

6 $A(3, -1)$, $B(-1, 7)$ and $C(8, k)$ 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 $x^2 - 10x - 6 = 0$

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

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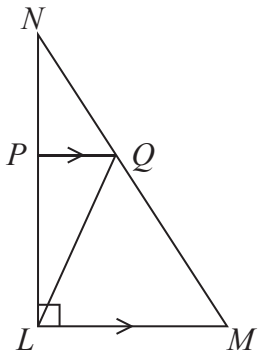
(Total for Question 7 is 3 marks)

8 LMN is a right-angled triangle.



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

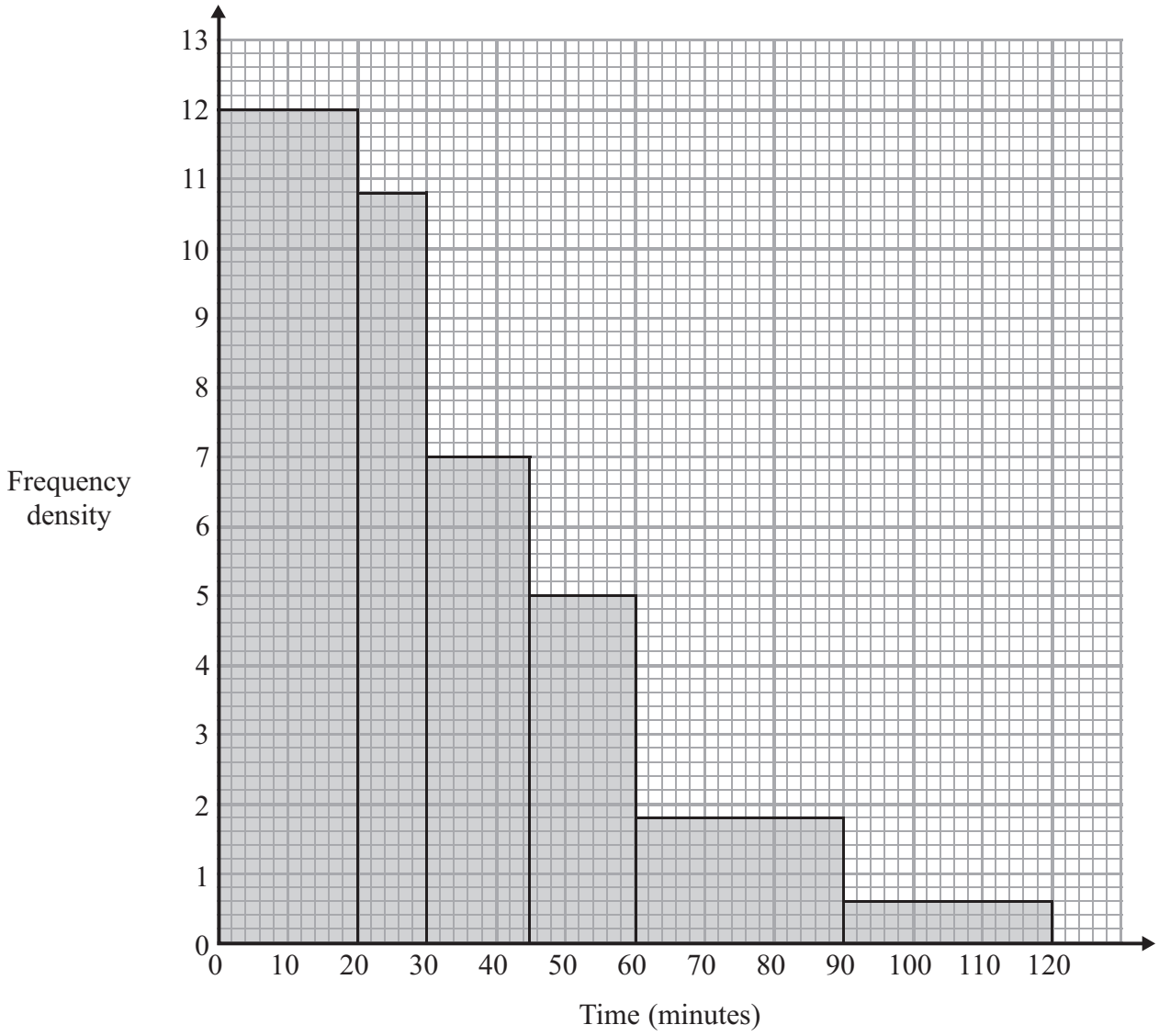
The area of triangle PNQ is 4 cm^2
The area of triangle LPQ is 12 cm^2

Work out the area of triangle LQM.

..... cm^2

(Total for Question 8 is 4 marks)

9 The histogram shows information about the times, in minutes, that some passengers had to wait at an airport.



(i) Work out the percentage of the passengers who had to wait for more than one hour.

.....

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

.....

.....

(Total for Question 9 is 4 marks)

10 Simplify fully $\dfrac{2x-2}{x+5} \div \dfrac{x^2-4x+3}{2x^2+13x+15}$

(Total for Question 10 is 4 marks)

11 Solve the inequality $x^2 < 4(x + 8)$

(Total for Question 11 is 4 marks)