

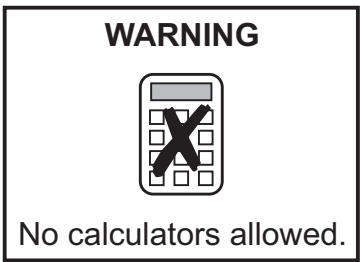
Surname						Initial(s)					
Centre Number						Candidate No.					

**General Certificate of Secondary Education
MATHEMATICS Higher Tier**

Time: 1 hour 45 minutes

Materials required for examination

- Ruler graduated in centimetres and millimetres, protractor, compasses, pen, HB pencil, eraser.
- Tracing paper may be used.
- A formula sheet can be found on the inside back cover or downloaded from www.brookworth.co.uk.



Instructions to candidates

- In the boxes above, write your surname, initial(s), centre number and candidate number.
- Answer ALL the questions in the spaces provided in this question paper.
- Write your answers in blue or black ink. Draw diagrams in pencil.

Information for candidates

- There are 100 marks in total for this paper.
- You must **not** use a calculator.

Advice for candidates

- Read each question carefully. Make sure you know what to do before you start to answer the question.
- Show your working. You may get marks for this even if the final answer is wrong.
- Do not spend too long on one question.
- If you cannot answer a question, leave it and attempt the next one. If you have time, you can return to those you left out at the end.

Marks for Exam 1 Paper 1	
Pages	Mark
4–5	
6–7	
8–9	
10–11	
12–13	
14–15	
16	
Total	

20 Rationalise these fractions so that there are no surds in the denominators.

(a) $\frac{1}{\sqrt{7}}$

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Answer..... (1 mark)

(b) $\frac{30}{\sqrt{5}}$

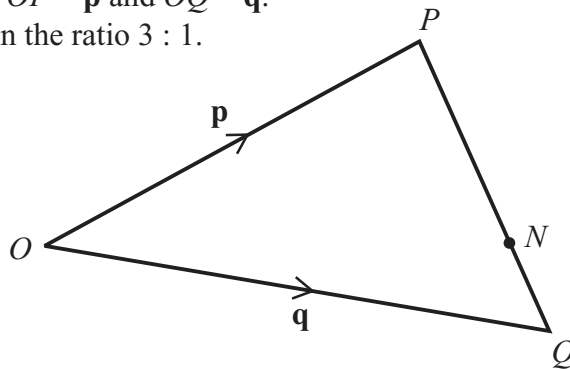
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Answer..... (2 marks)

21 In the diagram $\vec{OP} = \mathbf{p}$ and $\vec{OQ} = \mathbf{q}$.
 N divides PQ in the ratio 3 : 1.



Not to scale

(a) Find \vec{PQ} in terms of \mathbf{p} and \mathbf{q} as simply as possible.

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Answer..... (2 marks)

(b) Find \vec{ON} in terms of \mathbf{p} and \mathbf{q} as simply as possible.

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Answer..... (3 marks)