

# Oxford Pure Maths Open Day Talk

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Here are some suggestions for further reading following my talk at the Open Day.

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The Oxford Mathematics Alphabet  
<https://www.maths.ox.ac.uk/r/alphabet>  
includes “E is for Elliptic Curves”.

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I sketched an argument for finding all the solutions to the equation  $y^2 = x^3 - 2$ . The ideas are related to those in the Oxford third-year course *Algebraic Number Theory*, see <https://courses.maths.ox.ac.uk/node/42019>

— in particular, the equation  $y^2 = x^3 - 2$  is a well known example, and the argument is given in full in Theorem 3.3.1 (page 37) of the online lecture notes [https://courses.maths.ox.ac.uk/node/view\\_material/48320](https://courses.maths.ox.ac.uk/node/view_material/48320)

Note that these are technical lecture notes to accompany a third-year undergraduate course, so you are not expected to understand them at this stage!

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For much, much more about this sort of mathematics, including an outline of Andrew Wiles’s work on elliptic curves relating to Fermat’s Last Theorem, see the book *Algebraic Number Theory and Fermat’s Last Theorem* by Stewart and Tall. This is a technical book (a textbook), it’s not bedtime reading!

The book *Fermat’s Last Theorem* by Simon Singh is much closer to bedtime reading, and excellent bedtime reading at that. Singh wrote it having created the BBC Horizon documentary of the same name, which is available to watch on iPlayer at <http://www.bbc.co.uk/iplayer/episode/b0074rxx/horizon-19951996-fermats-last-theorem> — it’s well worth watching.

I also wrote a little about Fermat’s Last Theorem and some of the ideas I touched on during the talk in my book *Closing the Gap: the quest to understand prime numbers*.

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Other Oxford courses I mentioned include

- First year
  - Groups and Group Actions  
<https://courses.maths.ox.ac.uk/node/43835>
  - Analysis I  
<https://courses.maths.ox.ac.uk/node/43846>

- Second year
    - Rings and Modules  
<https://courses.maths.ox.ac.uk/node/44027>
    - Number Theory  
<https://courses.maths.ox.ac.uk/node/44147>
    - Projective Geometry  
<https://courses.maths.ox.ac.uk/node/44158>
  - Third year
    - Algebraic Number Theory  
<https://courses.maths.ox.ac.uk/node/42019>
    - Algebraic Curves  
<https://courses.maths.ox.ac.uk/node/42011>
    - Geometry of Surfaces  
<https://courses.maths.ox.ac.uk/node/41996>
    - Topology and Groups  
<https://courses.maths.ox.ac.uk/node/42027>
  - Fourth year
    - Elliptic Curves  
<https://courses.maths.ox.ac.uk/node/42540>
- and a whole load of courses that I didn't explicitly mention during the talk!