Further reading

If you enjoyed this book, which I hope you did, then you may find these other books, papers and websites of interest.

Books

The IMO Compendium, **by Djukić, Janković, Matić and Petrović:** This book is divided into a list of useful theorems, a massive repository of shortlisted IMO problems, and solutions to the aforementioned problems. If you're training for international competitions, this will give you surplus experience.

A Mathematical Olympiad Primer, **by Geoff Smith:** If you have no past experience of mathematical olympiads, this is the place to begin.

Plane Euclidean Geometry, **by Bradley and Gardiner:** This is a rigorous exploration of Euclidean geometry, including more basic techniques such as angle chasing and similar triangles in addition to vectors, Cartesian coordinates and trigonometry.

The Elements, **by Euclid:** This constructive approach to geometry begins with five postulates from which everything else is proved. It is possible to define 'non-Euclidean geometries', such as spherical and hyperbolic geometry, by rejecting a subset of these postulates.

Introduction to Number Theory and Inequalities, **by Christopher Bradley:** Affectionately known as 'INTI', this book covers these topics in extensive detail. At the expense of losing a catchy acronym, it has since been separated into two disjoint books, unsurprisingly called *'Introduction to Inequalities'* and *'Introduction to Number Theory'*.

The Symmetries of Things, **by Conway, Burgiel and Goodman-Strauss:** In addition to the familiar Platonic solids and regular tilings, there is a cornucopia of objects with fascinating symmetry. This book features a systematic exploration of different symmetry groups in two, three and four dimensions.

An Introduction to Diophantine Equations, **by Titu Andreescu and Dorin Andrica:** The title of the book is rather self-explanatory.

Complex Numbers from A to... Z, **also by Andreescu and Andrica:** This features an exploration of the Argand plane, including a substantial amount of triangle geometry.

The Algebra of Geometry, **by Christopher Bradley:** Coordinate methods, such as Cartesian, areal and projective coordinates, can be employed to solve geometry problems with varying degrees of success. If you want to learn more about them, this book is ideal.

Online resources

Complex Projective 4-Space (http://cp4space.wordpress.com): My website, which is updated periodically with mathematical miscellany.

Wolfram MathWorld (http://mathworld.wolfram.com): This is an online encyclopedia containing definitions and information about practically every mathematical concept discovered.

Areal Co-ordinate Methods in Euclidean Geometry, **by Tom Lovering** (http://www.bmoc.maths.org/home/areals.pdf): This is more succinct than Bradley's book, but definitely worth reading.

Curves in cages: an algebro-geometric zoo, **by Gabriel Katz** (http://arxiv.org/abs/math/0508076): A special case of the generalised Cayley-Bacharach occurs when two of the curves are unions of lines. This leads to some interesting generalisations of Pascal's theorem, complete with proofs.

Online Encyclopedia of Integer Sequences, **by N. J. A. Sloane** (http://oeis.org/): A continually expanding collection of over 200 000 sequences of integers. Practically every conceivable integer sequence (well, 200 000 out of $2^{\aleph_0}$) is featured somewhere within this vast repository.

Encyclopedia of Triangle Centres, **by Clark Kimberling** (http://faculty.evansville.edu/ck6/encyclopedia/ETC.html): If you close this book and gaze at the front cover, you will see a configuration of triangle centres. In reality, there are uncountably infinitely many possible triangle centres, over five thousand of which are featured on this website. Moreover, there is a method of searching for triangle centres based on *trilinear coordinates*.

Virtual Geoff Smith (http://people.bath.ac.uk/masgcs/): This features some papers by Geoff and Bradley, including the combinatorics of snail venom. Exciting!

UK IMO Register, **by Joseph Myers** (http://imo-register.org.uk/): A hall of fame of everyone who has represented this sceptred isle in any of the five main mathematical olympiads (RMM, IMO, BalkMO, EGMO and CGMO). Also, you can browse reports of competitions, such as Richard Freeland's excellent and witty report of RMM 2011.

The UVW method, **by Tejs** (http://ohkawa.cc.it-hiroshima.ac.jp/AoPS.pdf/The%20 uvw %20 method.pdf): The first paper describing the use of the $u\,v\,w$ method of solving trivariate symmetric polynomial inequalities.

What is... a Dimer, **by Richard Kenyon and Andrei Okounkov** (http://www.ams.org/notices/200503/what-is.pdf): We touched upon bipartite matchings and domino tilings in the first chapter, but this is a more detailed analysis.

Discussion forums

Ask nRich (http://nrich.maths.org/discus/messages/board-topics.html): A friendly atmosphere where everyone is nice and polite towards each other, helping to solve problems in an idyllically co-operative way.

MathLinks (http://mathlinks.ro): A fierce battleground where unwitting bypassers are sadistically subjected to supposedly 'trivial' problems. The atmosphere differs greatly from *nRich*, being described as 'the difference between carnivores and herbivores'.