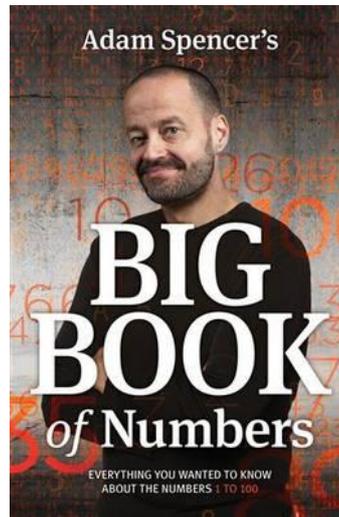# Book review

Adam Spencer (2014). *Adam Spencer's big book of numbers: Everything you wanted to know about the numbers 1 to 100.* **Sydney, NSW: XOUM Publishing.**

ISBN 9781921134326 (print), 9781921134333 (digital)

viii + 422 pages

RRP AU$29.95

Supplementary teacher notes: *Lesson plans: A year's worth of extension lessons and challenging exercises*. 32 pages.

RRP AU$9.95

Available at https://adamspencer.com.au/

Adam Spencer is a self-confessed sleek geek and champion of geeks everywhere, and I am sure that he needs no introduction. Those for whom Spencer is "merely" a Triple J or ABC radio host, Raw Comedy comedian, champion debater, or namesake for Asteroid 18413 may wish to meet the "real" Adam by viewing his TED talk accessible at

http://www.ted.com/talks/adam_spencer_why_i_fell_in_love_with_monster_prime_numbers?language=en#t-83985

The investment of 17 minutes of your time will be well rewarded.

The *Big book of numbers* provides a rich source of information on the history, mathematics, pop culture and important facts (read "general trivia") of the first 100 positive integers or counting numbers, with a sprinkle of science thrown in for good measure. This is best illustrated by way of example. Since my favourite integers, such as 163 and 1729, are beyond the scope of this book (yes, OK, there is a whisper of 1729 on p. 39, but Adam, when is your next book coming out?), I selected an entry at random. Well, this is not exactly true, since, somewhat akin to Tom Collins choosing what to

write about in *Such is life*, I let the book fall open somewhere towards the middle, which is certainly not random. The result: 47.

What notions immediately spring to mind at the mention of 47?

There is a society dedicated to the number 47, called The 47 Society, apparently because 47 crops up "at random" more often than any other number. Whether or not they know it, Trekkers (Star Trek fans) will see 47 everywhere. Silver (Ag) has atomic number 47. The orbit of Mars has a cycle of exactly 47 years. 47 is the fifteenth prime number. It is the ninth Lucas number (Lucas numbers are similar to Fibonacci numbers, starting with 2, 1). It may be expressed as the difference of two squares, $24^2 - 23^2$, and as the sum of four squares in two different ways, $1^2 + 1^2 + 3^2 + 6^2$, and $2^2 + 3^2 + 3^2 + 5^2$.

Spencer prefers, however, the delightful esoterica of:

- Cunningham chains (starting, say, with 2, doubling and adding one gives 5, and repeating this process gives the sequence 2, 5, 11, 23, 47, which are all prime, but the next number 95 is not, so the sequence is a Cunningham chain of length 5);
- Ulam numbers (starting with 1, 2, 3, write the numbers that can be written once and only once as the sum of 2 numbers in the list, producing 1, 2, 3, 4, 6, 8, 11, 13, …);
- Pedal harps (concert grand pedal harps have 47 strings, covering six and one-half octaves);
- Keith numbers (from 47, 4 + 7 = 11, 7 + 11 = 18, 11 + 18 = 29, 18 + 29 = 47); and
- a very pretty puzzle on the number of triangles in a given, simple-looking, symmetrical shape, which is surprisingly quite difficult.
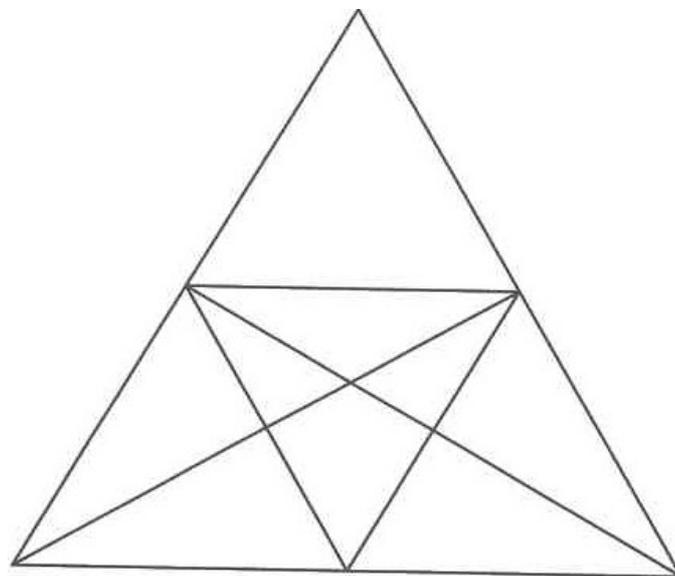
Figure, from p. 188

Throughout the book, most of these such snippets are presented in the form of an activity, or are accompanied by challenges more than suitable for bright and inquiring minds, young and old. As well as that, for a triangular number of extra dollars, there is a set of teacher notes or "lesson plans" full of great ideas, even if they are a tad light-on so far as a pedagogical framework is concerned.

This book is fun. It makes compulsive, infectious and addictive reading, and will bring many hours of pleasure for those who want to learn and explore wonderful things about the numbers 1 to 100.

Peter Merrotsy

The University of Western Australia

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