

## Editorial

Dear Readers,

welcome to this issue of *Parabola*!

What is the difference between pure and applied maths? I have been asked this questions by many students, and I used to think that I had some good answers. Now, some years later, those answers seem wrong: maths does not have intrinsic purity or application. Maths that feels pure later finds application, and maths that is applied often evolves into purely theoretical pursuit.

These symbiotic and shifting contexts of maths are illustrated nicely by the articles of this issue. In the first article, Johnny Wong provides a clear and interesting introduction to Markov chain modelling, by analysing how long you might have to wait to use the bathrooms when you're living together with others. In the second article, Marius-F. Danca, Guanrong Chen and Nikolay Kuznetsov analyse and present new research on the fascinating aircraft squadron problem, which is to determine how far at least one of a number of planes can fly if the planes are able to share fuel.

Is the maths in these articles pure or applied? These articles address modelling of real-life scenarios, and yet the scenarios are fictional narratives to support interesting mathematical questions. And yet again, these scenarios actually happen(ed) in real life and require(d) sometimes vital mathematical modelling. And so on; we can escape this spiral of sophistry by noting that the question does not fully make sense.

The third article also illustrates this point. To the ancient Babylonians, Pythagorean triples were highly useful for practical calculations. Nearly four thousand years later, these highly applicable triples attract only theoretical interest. Incidentally, that interest has not lead to much research on the triples, and there has not been much insight into their constructions and inter-relationships. It is therefore exciting to read this issue's third article, in which high-school student Bodhideep Joardar provides new research and insight, long overlooked through history, to show how Pythagorean triples are all related by finite chains of compositions and decompositions.

It should encourage readers to see that new and significant research is possible to achieve, by everyone, even in (conventional) mathematical areas that are among our oldest! I therefore invite you, dear Reader, to explore and find new maths yourself. And please contribute your material to *Parabola*: pure or applied, either or neither.

Please also enjoy this latest batch of David Angell's expertly crafted mathematical problems, as well as the beautiful and punny comic *Square root of negative pun* by Robert Schneider, Michael Klipper and Mike Chapman.

Warm regards to you all!,

Thomas Britz  
Editor