

# Introduction

The approach taken in this book is to treat Trig as a game. Beginning with only the definition of **sine**, the superstar of Trig, the book introduces the reader slowly to the basics of Trig. Then, by applying simple logic, the two co-stars, **cosine** and **tangent**, are introduced.

Thereafter three supporting starlets, named the reciprocals — *cosecant*, *secant* and *cotangent* — are added. With these six pieces, the application of simple logic, arithmetic and algebra will give countless Trig equations called identities. Played like jigsaw puzzles, Tetris and Sudoku, moving the Trig pieces around to give different identities can be a lot of fun.

As with other games and puzzles, practice can lead to greater skill and mental agility. About 300 games (proofs) are provided in this book to give fun (and confidence) to readers who want to try their hands (and work their brains) on these intellectual games. The numerous games are broadly grouped into three overlapping levels — Level-One-Games (Easy Proofs), Level-Two-Games, (Less-Easy Proofs) and Level-Three-Games (Not-so-Easy Proofs).

For the first time ever, a “Concordance of Trigonometric Identities” has been created. Trigonometric identities are given a 6-digit code, which enables readers (and students) to have easy reference to the identity to be proved, and to locate rapidly the proof in the Encyclopedia of Trigonometric Identity Proofs (TIPs) in the Appendix.

Readers are welcome to look at the identities in the Concordance first, and try their hand at proving any of the identities, prior to looking at the

detailed proofs in the Encyclopedia. (Some identities which may appear simple, may be difficult to prove; conversely, some complex-looking identities may turn out to be relatively easy!)

The games provide the challenge to readers to match their skills, and progress up the ladder of increasing intellectual agility. If you are really good in Trig, then the speed of proving the identities is the speed with which you write out the proofs, i.e. your brain works faster than your brawn (hand).

**Have fun with Trig!**