

## BOOK REVIEWS

Edited by ANDY LIU

### Dissections : Plane & Fancy

by Greg N. Frederickson,

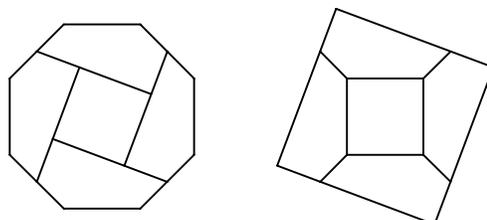
published by Cambridge University Press, 1997,

ISBN# 0-521-57197-9, hardcover, 310+ pages, \$34.95.

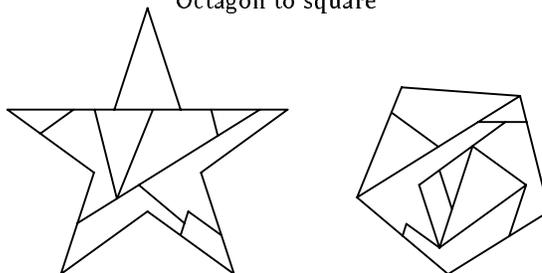
Reviewed by **Andy Liu**, University of Alberta.

This is a much awaited sequel to Harry Lindgren's 1964 classic work, **Geometric Dissections**, which the author (G.N.F.) revised and augmented in the 1972 Dover edition. Actually, the current volume is much more than just a sequel. It is the most comprehensive treatise on the subject of geometric dissections. It may be enjoyed on at least three levels.

First and foremost, this book is a collection of interesting dissection puzzles, old and new. Only some background in high school geometry is needed to fully enjoy these problems. *Can you cut an octagon into five pieces and rearrange them into a square? How about turning a star into a pentagon?* The solutions, which are both appealing but for somewhat opposing reasons, are shown below.

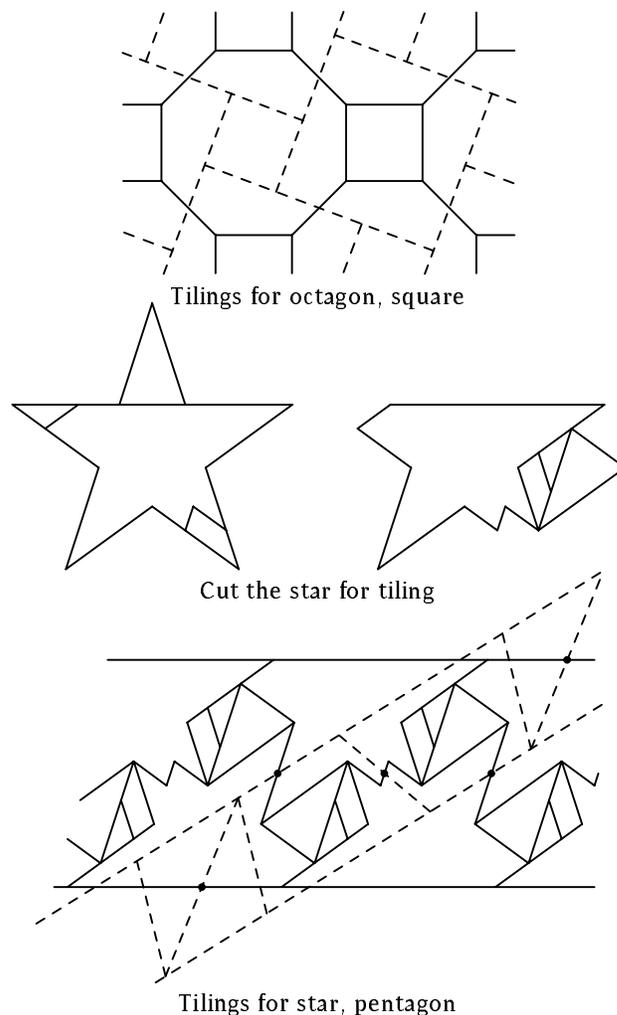


Octagon to square



Star to pentagon

This book is also an instructive manual on the art and science of geometric dissections. While one may admire the ingenuity which produced the spectacular solutions, the author probes into the underlying fabric which might have led to such incisive insight. Many techniques are discussed, too many to enumerate here. A favourite is that of tessellation. Below are two tilings which might have suggested the dissections above.



Finally, this book is an important historical document, detailing the inter-cultural development of the subject. *Travel from the palace school of tenth-century Baghdad to the mathematical puzzle columns in turn-of-the-century newspapers, from the 1900 Paris Congress of Mathematicians to the night sky of Canberra.* Readers puzzled by this quote need look no further than the illustrious names of Abū'l Wafā, Henry Dudeney/Sam Loyd, David Hilbert/Max Dehn and Harry Lindgren. Biographical sketches of Wafā, Dudeney, Loyd and Lindgren are provided, along with those of over forty other people who have made significant contributions to geometric dissections. The writing style is very engaging, and the book is good reading even if one skips over some of the more complicated technical details.

In conclusion, the reviewer echoes Martin Gardner that this book will be a classic. It comes with the highest recommendation.