Counting (2nd Edition)

by Asia Pacific Mathematics Newsletter - Monday, September 09, 2013

http://gonitsora.com/counting-2nd-edition/

Koh Khee Meng and Tay Eng Guan.

World Scientific, 2013, xii+209 pp

This book is about the art of counting using some basic principles of combinatorial mathematics. It starts from scratch and is meant for students and teachers at the upper secondary and undergraduate level. This second edition is an amalgamation of the 12 chapters of the first edition and the supplementary chapters of its accompanying solutions manual. About half of the book (presumably the first 12 chapters) is based on a series of articles written by the authors and published in Singapore Mathematical Society's magazine "Mathematical Medley".

Mathematics originated primarily from counting and is, of course, still concerned to a large extent about counting various kinds of "concrete" objects like arrangements and patterns and mathematical objects like prime numbers, partitions of sets and numbers, and so on. Rather than being simply satisfied with successfully applying ad-hoc techniques for different counting problems, the mathematician seeks to distill general principles and formulate widely encompassing methods for as large a class of problems as possible.

The authors set out to present such basic principles like the addition, multiplication, bijection and pigeonhole principles and the principle of inclusion and exclusion and to illustrate how these principles are used to solve a wide range of counting problems. Counting problems are generally hard to solve and often require skills that come from training in problem solving. In some sense, this book has succeeded in providing some training of this kind. Wherever possible, recipes for certain types of counting problems are stated. The best way to teach is by example, and the authors give numerous examples to show how these recipes can be applied to specific problems. The explanation is lucid and enhanced with figures and diagrams. In particular, there are some nice examples involving the use of the pigeonhole principle which is easy to state and understand but hard for one to be able to apply in the correct context.

In addition to the basic principles of counting, there is a short introduction to recurrence relations and the two classical numbers of combinatorics— the Stirling numbers (of the first and second kind) and Catalan numbers. The connection of these numbers with counting problems is clearly elucidated.

There are some short historical and biographical snippets that make the reading interesting. Each chapter comes with a set of exercises to test the basic understanding of the techniques given in that chapter. For those who would like to further test and hone their problem solving skills, the last chapter lays the testing ground with a list of 60 additional problems. Answers to the exercises are appended with ample hints. This book is a welcome contribution to the teaching and learning of problem solving skills for counting

problems.

Y K Leong

National University of Singapore.

*Source:- **Asia Pacific Mathematics Newsletter**, Volume 3 No. 2 (April 2013).*

*It has been republished here with a special permission from **World Scientific**.*

[ad#ad-2]

_____

PDF generated from http://gonitsora.com/counting-2nd-edition/.