

# Lectures on Challenging Mathematics

## UC2 Combinatorics An Invitation to Computational Mathematics

Winter 2017

Zuming Feng  
Phillips Exeter Academy and IDEA Math  
zfeng@exeter.edu

©Copyright 2008 – 2017 Idea Math

*“Cogito ergo Sum” – “I think, therefore I am”*

René Descartes (1596-1650)

©Copyright 2008 – 2017 Idea Math

Idea Math

Internal Use

# Contents

©Copyright 2008 – 2017 Idea Math

|          |                            |          |
|----------|----------------------------|----------|
| <b>1</b> | <b>Combinatorics</b>       | <b>3</b> |
| 1.1      | Counting practice (part 1) | 3        |
| 1.2      | Counting practice (part 2) | 4        |
| 1.3      | Taking care of orders      | 5        |
| 1.4      | Moving on a grid           | 7        |
| 1.5      | Counting practice (part 3) | 8        |
| 1.6      | Counting practice (part 4) | 9        |
| 1.7      | Number of subsets          | 10       |
| 1.8      | Binomial coefficients      | 11       |
| 1.9      | Counting practice (part 5) | 12       |
| 1.10     | Counting practice (part 6) | 13       |

Internal Use