

Combinatorics: The Breakfast of Mathletes

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Print, Online, and Other Resources

I. Problems and Problem-Solving Strategies

- A) Math contests, especially:
 - 1) MathCounts, for introductory problems: www.mathcounts.org
 - 2) AIME-level, for more challenging problems – at AoPS or at www.unl.edu/amc/
- B) The “Calendar” in the *Mathematics Teacher*
- C) The rec.puzzles archive: mathforum.org/rec_puzzles_archive/combinatorics
- D) *How to Solve It*, George Pólya
- E) Art of Problem Solving: www.artofproblemsolving.com and many books, including *Introduction to Counting and Probability* and *Intermediate Counting and Probability*
- F) Herr & Johnson, *Problem Solving Strategies: Crossing the River with Dogs and Other Mathematical Adventures*: www.keypress.com/x5488.xml
- G) Traditional problems from the New York State Regents exams (JMAP: www.jmap.org)
 - 1) Math A: Multiplication Counting Principle, Permutations, Combinations, Venn Diagrams, Probability (Theoretical, Multiple Events, Geometric), Sample Space
 - 2) Math B: Binomial Expansion, (Binomial) Probability, Summations

II. Textbooks you could use with students

- A) *Algebra Through Problem Solving*, www.thiel.edu/mathproject/atps/default.htm
- B) UCSMP *Precalculus and Discrete Mathematics*, socialsciences.uchicago.edu/ucsmp/
- C) Brown, *Advanced Mathematics: Precalculus with Discrete Math. & Data Analysis*

III. Textbooks which you could use for yourself

- A) Joe Malkevitch’s book list: york.cuny.edu/~malk/biblio/combinatorics-biblio.html
- B) Brualdi, *Introductory Combinatorics*, 4 ed. (used copies of 3 ed. \$15 & up Amazon)
- C) Balakrishnan, *Schaum's Outline of Combinatorics* (\$13 new on Amazon)
- D) Babai, “Discrete Mathematics” (draft): people.cs.uchicago.edu/~laci/07paris/dm.pdf
- E) Wilf, *generatingfunctionology*: www.math.upenn.edu/~wilf/DownldGF.html

IV. Mathematical research projects for high-school students

- A) Guide: york.cuny.edu/~malk/high-school-research/high-school-research.html
- B) Rutgers Young Scholars Program in Discrete Mathematics: dimacs.rutgers.edu/ysp/

V. Other neat stuff

- A) *The Number Devil*, Hans Magnus Enzensberger
- B) Zome Tools: <http://zometool.com/>
- C) Set® Game: <http://setgame.com/> (see especially the *Set® Mathematics Workbook*)
- D) Patterns in Pascal’s triangle: <http://ptr1.tripod.com>
- E) Coloring it: www.cecm.sfu.ca/organics/papers/granville/support/pascalform.html
- F) The Amazing Mathematical Object Factory: www.theory.cs.uvic.ca/~cos/amof/
- G) DHS DyDAn @ DIMACS (Rutgers) Workshop on the Mathematics of Homeland Security: http://dimacs.rutgers.edu/k12-prof-dev/homeland_security/