Math Competition Handouts

Here are some handouts for math competition preparation that I have put together:

Olympiad Level

- Exponents and Primes (/uploads/7/2/5/6/72566533/exponentsprimes.pdf) (Hints (/uploads/7/2/5/6/72566533/exponentsprimeshints.pdf))
- Polynomials (/uploads/7/2/5/6/72566533/polynomials.pdf)
- Sequences (/uploads/7/2/5/6/72566533/sequences.pdf)
- Projective Geometry (/uploads/7/2/5/6/72566533/projectivegeometry.pdf) (Solutions (/uploads/7/2/5/6/72566533/projectivegeometrysolutions.pdf))
- Projective Geometry Continued (/uploads/7/2/5/6/72566533/projectivegeometrycontinued.pdf) (Solutions (/uploads/7/2/5/6/72566533/projectivegeometry2solutions.pdf))
- Russian-Style Problems (/uploads/7/2/5/6/72566533/miscellaneousproblems.pdf) (Solutions (/uploads/7/2/5/6/72566533/miscellaneousproblemssolutions.pdf))

Pre-Olympiad Level

- Combinatorics:
  - Counting: Part 1 (/uploads/7/2/5/6/72566533/mc_counting.pdf)
  - Counting: Part 2 (/uploads/7/2/5/6/72566533/mc_counting2.pdf)
  - Counting: Hard Problems (/uploads/7/2/5/6/72566533/mc_countinghard.pdf)
- Geometry:
  - Geometry: Part 1 (/uploads/7/2/5/6/72566533/mc_geometry.pdf)
  - Geometry: Part 2 (/uploads/7/2/5/6/72566533/mc_geometry2.pdf)
- Algebra:
  - Quadratic Polynomials: Part 1 (/uploads/7/2/5/6/72566533/mc_algebra1.pdf)
  - Quadratic Polynomials and Some Contest Problems: Part 2 (/uploads/7/2/5/6/72566533/mc_algebra2.pdf)
- Number Theory:
  - Properties of Integers: Part 1 (/uploads/7/2/5/6/72566533/ut_integers1.pdf)
  - Properties of Integers: Part 2 (/uploads/7/2/5/6/72566533/ut_integers2.pdf)
- Other:
  - Mathematical Induction (/uploads/7/2/5/6/72566533/induction.pdf) (Solutions (/uploads/7/2/5/6/72566533/inductionsolutions.pdf))
  - Mathematical Games (/uploads/7/2/5/6/72566533/mc_games.pdf)
  - Euclid Math Competition Preparation (/uploads/7/2/5/6/72566533/mc_euclidprep.pdf)

Useful Links

- Art of Problem Solving Forum (http://www.artofproblemsolving.com/Forum/index.php) - math forum with a huge collection of math problems of all difficulty levels
- Canadian IMO Training Website (http://sites.google.com/site/imocanada/) - contains past Canadian IMO training materials and other links
- Yufei Zhao's collection of handouts (http://web.mit.edu/yufeiz/www/olympiad.html) - collection of excellent Olympiad handouts by Yufei Zhao
- Russian Problems (http://www.problems.ru/) - A large collection of problems from Russian competitions and books (website is in Russian)

Other Math Competition Information

International Math Olympiad

The International Mathematical Olympiad (http://www.imo-official.org/) is the most prestigious mathematics competition for high school students around the world. Participating in this contest is a wonderful experience, and I was lucky enough to participate in this competition twice as a

student. I would like to thank everyone who helped in training me during my school years.
The best advice that I would give to a student who wants to reach the very top is to **PRACTICE**. (This works not only in competitions but for most other things in life).

I was the Deputy Leader Observer of the Canadian International Mathematical Olympiad Team in 2010. Our students placed 13th out of 96 countries.
Canadian IMO Team 2010 Homepage (http://cms.math.ca/Competitions/IMO/2010)
In 2012 Canada placed 5th out of 100 countries, which is by far the best result in Canadian history, and an incredible accomplishment.

Selection Process
In November students write the Sun Life Canadian Open Mathematics Challenge (http://cms.math.ca/Olympiads/DOCM/). Anyone is allowed to write the competition. Based on the results of this competition, approximately the top 70 students are selected to write the Canadian Math Olympiad (CMO) (http://cms.math.ca/Competitions/CMO/). The next ~100 students write the COMC Repechage (http://cms.math.ca/Competitions/REP/), and the top 15-20 students among them are also invited to write the CMO. Approximately the top 30 students on the COMC are also selected to write the Asian Pacific Math Olympiad (http://cms.math.ca/Competitions/APMO/) and the USA Math Olympiad (http://amc.maa.org/usamo/usamo.shtml).
Based on the results of the three Olympiads, a team of 6 students is selected to represent Canada at the International Math Olympiad.

IMO Winter Camp
There is a week-long training camp in January for around 12-15 Canadian students. Students are selected to attend the camp mainly based on their Olympiad results the previous year. The camp is usually held at York University.

IMO Summer Camp
Prior to the IMO, the Canadian team attends a (usually) 2-week long training camp. The camp is held in different locations during different years. In the past it has been held at Banff International Research Station, Wilfrid Laurier University, University of Halifax, and other Canadian universities. Sometimes the Canadian team trains together with a team from another country.

Math Enrichment Programs
Some enrichment programs for high school students in Canada:

- University of Toronto Math Club (http://www.math.toronto.edu/oz/turgor/club.php)
- Toronto Math Circles (http://www.fields.utoronto.ca/programs/mathed/math_circles/)
- Waterloo Math Circles (http://cemc.uwaterloo.ca/events/mathcircles.html)

If you know any other programs, please let me know, and I will be happy to update this list.