



Calgary Olympic Math & Computer School

Mathematics Olympiad Program

Allan Dong, Ph.D., Principal

COMCS

403-397-8289

allan.dong@olympicmathschool.ca

Calgary Alberta Canada

2010-2018

Calgary Olympic Math & Computer School

Valley Creek CHARGERS

Pride in our Community
Opportunities to Succeed
Wonder of Discovery
Eagerness to Learn
Respect for All



NW campus, 16951 Hidden Valley Dr., NW, Calgary

Respect yourself and others
Respect our environment
Respect learning

WARRIORS



SW campus, 12424 Elbow Dr., SW, Calgary



SE campus, 9 Legacy Landing, SE, Calgary

- 3 administrators
- 8 math teachers
- ~120 students

Math Program

- Kangaroo math
- Gauss math
- CJHSMC
- AHSMC
- CIMC
- CSMC
- COMC
- CMO
- IMO

Coding Program

- Scratch
- Python
- C++ (Java)

How kids can do better while learning the math

- Why improve math skills?
 - Math is a part of our lives. We use math everyday, sometimes without even realizing it.
 - Math is critical for the success of kids in modern world
- We can enhance kids' ability in math:
 - By applying the time-proved methods in learning math
 - By following intrinsic ways in math– case study, observation, induction/deduction, and power of abstraction
 - By revealing rich connections and beautiful structures, and instilling the love of math
 - By encouraging them to participate in competitions and finding them a platform to showcase their talent

Beauty of Mathematics

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26

H-A-R-D-W-O-R- K

$$8+1+18+4+23+15+18+11 = 98$$

And:

K-N-O-W-L-E-D-G-E

$$11+14+15+23+12+5+4+7+5 = 96$$

But:

A-T-T-I-T-U-D-E

$$1+20+20+9+20+21+4+5 = 100$$

L-O-V-E-O-F-G-O-D

$$12+15+22+5+15+6+7+15+4 = 101$$

Beauty of Mathematics

$$\begin{aligned}1 \times 8 + 1 &= 9 \\12 \times 8 + 2 &= 98 \\123 \times 8 + 3 &= 987 \\1234 \times 8 + 4 &= 9876 \\12345 \times 8 + 5 &= 98765 \\123456 \times 8 + 6 &= 987654 \\1234567 \times 8 + 7 &= 9876543 \\12345678 \times 8 + 8 &= 98765432 \\123456789 \times 8 + 9 &= 987654321\end{aligned}$$

$$\begin{aligned}1 \times 9 + 2 &= 11 \\12 \times 9 + 3 &= 111 \\123 \times 9 + 4 &= 1111 \\1234 \times 9 + 5 &= 11111 \\12345 \times 9 + 6 &= 111111 \\123456 \times 9 + 7 &= 1111111 \\1234567 \times 9 + 8 &= 11111111 \\12345678 \times 9 + 9 &= 111111111 \\123456789 \times 9 + 10 &= 1111111111\end{aligned}$$

$$\begin{aligned}9 \times 9 + 7 &= 88 \\98 \times 9 + 6 &= 888 \\987 \times 9 + 5 &= 8888 \\9876 \times 9 + 4 &= 88888 \\98765 \times 9 + 3 &= 888888 \\987654 \times 9 + 2 &= 8888888 \\9876543 \times 9 + 1 &= 88888888 \\98765432 \times 9 + 0 &= 888888888\end{aligned}$$

Beauty of Mathematics

$$1 \times 1 = 1$$

$$11 \times 11 = 121$$

$$111 \times 111 = 12321$$

$$1111 \times 1111 = 1234321$$

$$11111 \times 11111 = 123454321$$

$$111111 \times 111111 = 12345654321$$

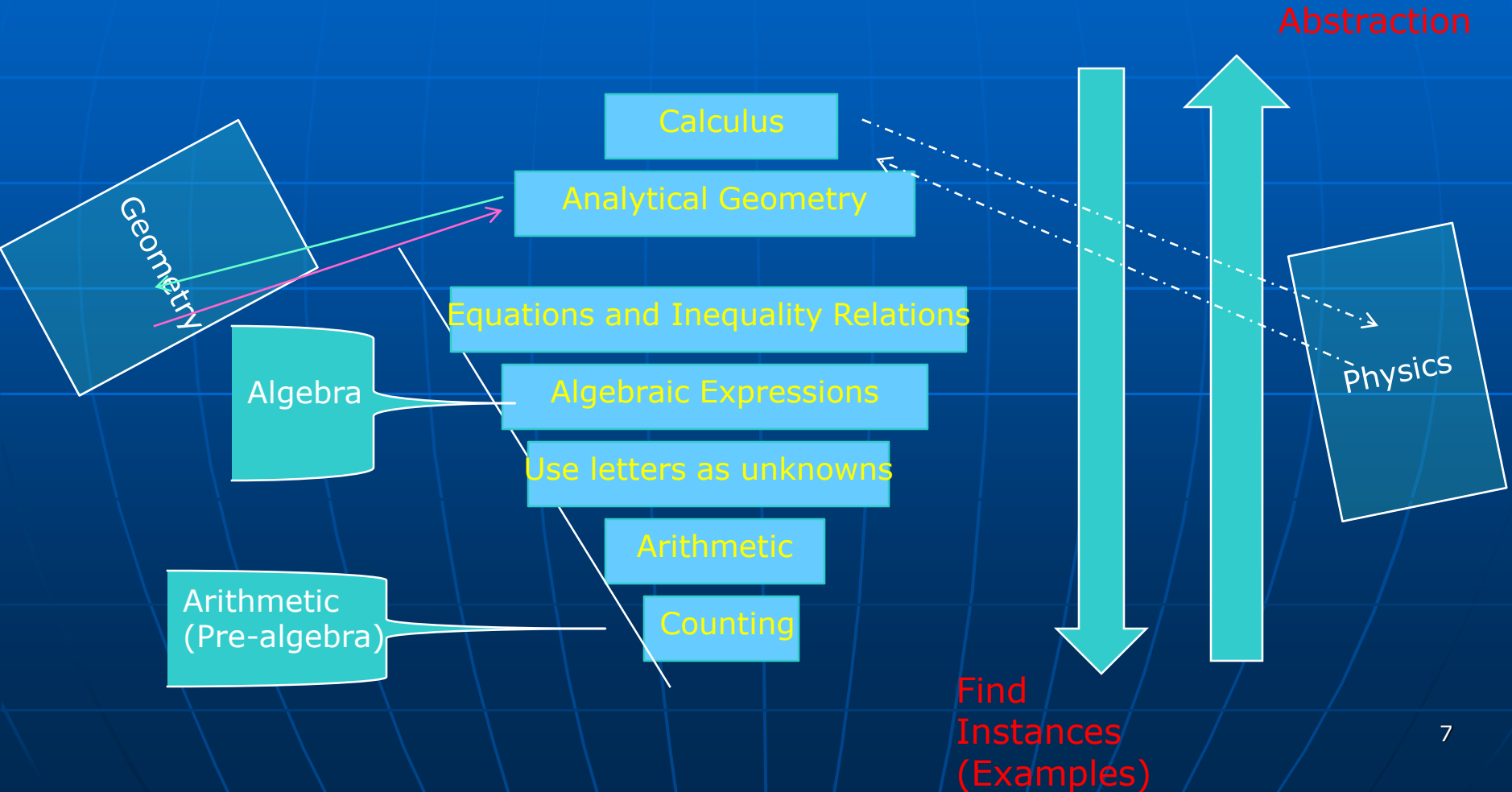
$$1111111 \times 1111111 = 1234567654321$$

$$11111111 \times 11111111 = 123456787654321$$

$$111111111 \times 111111111 = 12345678987654321$$

A Primer on Math Power

■ Abstraction



Yes, your kids can do it !

- One does not need to be a genius to do well at math
- Success in math = Love of math + willingness to learn & excel + good methods + proper training
- Teachers play an important role by being good guides that are willing to help your kids succeed

Our Philosophy of Teaching

- Instill the love of math and encourage talented youths to explore the power and the elegance of mathematics
- Practice. Practice makes perfect
- Cultivate a math-sense that is beneficial life-long
- Flexibility is built-in to accommodate different student levels while always encouraging students to try their best

Course Plan

- Start – strengthen essential abilities in:
 - Arithmetic number theory and advanced arithmetic techniques
 - Algebra manipulation (incl. linear, quadratic, rational and radical forms)
 - Geometric questions
 - Basic combinatorics
- Accelerate to full speed
 - Concepts in counting, permutation and combination
 - Solution of equations; introduced to number sequence
 - Functions, algebra as a framework

Course Plan

- Expand horizons and prepare for challenges
 - Common methods in algebra (as well as in geometry)
 - Continue to explore knowledge and skills in previous topics
 - Learn to appreciate math by revealing rich connections within mathematics and to real-life applications
 - Initial exposure to competition problem sets
 - Smooth transition /exploration for senior-level topics: quadratic forms, trigonometry, analytical geometry, statistics; advanced skills in equations and inequalities

In the Long Term

- Develop plans for mathematics enrichment that compliments what students learn at school
- Provide passionate students opportunities for growth beyond the curriculum supported by the CBE

The Road To IMO

- International Mathematical Olympiad (IMO)
- Power of IMO medalist
- Canadian Mathematical Olympiad (CMO)
- Canadian Open Mathematics Challenge (COMC), the main route to be qualified for the CMO
- AHSMC winners may be invited to the CMO

American Mathematics Competitions (AMC)

- AMC 8, 10, and 12
- AMC 8 has 25 multiple choice questions, 40 min, in Nov.
- AMC 10 and 12 have 25 multiple choice questions, 75 min, in Feb.

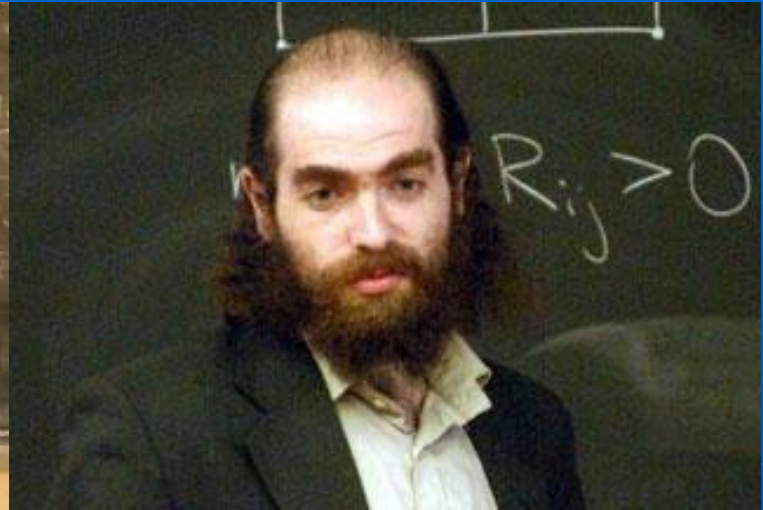
- Invitations to AIME
- “We encourage all students in grades 6, 7 and 8 to participate in the AMC 8.”
- “to promote excitement, enthusiasm and positive attitudes towards mathematics” (AMC 8)
- “most of the problems are challenging but within their grasp.” (AMC 10)
- “Talents will be enhanced if one practices beforehand, ... and most importantly, by studying mathematics more intensely than one normally does in high school. “ (AMC 12)

Canadian Mathematics Competitions (CMC)

- Contests for grades 7-12
- Contest date from Feb. to Apr.
- Register through school, unofficial contestants can register by mail or fax
- Multiple choice questions, 60 min. (Gr. 7-11)
- Questions requiring full solutions, 75 min. (Gr. 7-11)
- Euclid Contest (Gr. 12) has answer only and full solution questions, 2.5 hours
- “Students outside Ontario who are planning to attend an Ontario University often write the Euclid contest.”
- Prizes and scholarships



Terence Tao



Grigori Perelman

Fields Medalists

IMO Golden Medalists



Winners among our students

Calgary Junior Math Team Attack

- 2017 COMCS team, 1st place, gold medal

Calgary Elementary School Math Contest (CESMC)

- 2016, Brooks Liu (g5), Allan Cao (g6) and Richard Zhang (g6), First place, gold medal award with full mark
- 2015, Terry Tian (g6), First place, gold medal award with full mark
- 2015, Allan Cao (g5), Second place, silver medal award
- 2015, Ana Du Cristea (g5), Second place, silver medal award

Gauss Contest

- 2017, Jean Zhi, the first place in grade 7 with perfect score (150)
- 2016, Richard Zhang (g6), the first place in grade 7 with perfect score (150), Selena Zheng (g6) in the second place in grade 7 (138), and Riana Dutta and Allan Cao in the third place in grade 7 (137)
- 2015, Richard Zhang (g5), Allan Cao(g5), Terry Tian (g6), Jeff Wang (g7) (136)
- 2014, Kevin Wang, the first place with perfect score (150) .

Math Kangaroo Contest

- 2016, 2017 Brooks Liu (grade 5/6), the national gold medal.
- 2016, 2017 Riana Dutta (grade 7/8), the national gold medal.

COMC

- 2015, Yi Ding, the honor roll for grade 10 in Alberta
- 2014, Jane Shi, the best in Canada for grade 10
- 2014, Josh Geng, the best in Alberta for grade 10
- 2014, David Luo, Gold award in Alberta grade 8 and under
- 2013, Richard Kang, Bronze award in Alberta Champions, and gold award in Alberta grade 8 and under

Winners among our students

CIMC/CSMC

.2016, Richard Kang, CSMC gold medal

.2014, Rosie Zhao, the top score among Calgary participating students

Galois Contest (for grade 10)

.2016, John Zhu and Bill Li, the outstanding student in Calgary

.2014, Jane Shi, the top score among Calgary participating students

Fryer

.2015, Carman Hsinh in 38 scores (95% of 40 full mark), outstanding in Alberta, top 20 across Canada

.2015, Rosie Zhao in 36 scores (90%), outstanding in Alberta, top 80 across Canada

.2014, Josh Geng, the first place with perfect mark

Calgary Junior Math Contest (for grade 9)

40th(2016), Allan Cao (g6) , Kevin Wang (g8) and Andrew Li (g8), in the top 50

39th(2015), Richard Kang (g9), the first place

38th(2014), Richard Kang (g8), the first place

37th(2013), Richard Kang (g7), the first place

36th(2012), Richard Kang (g6), the third place

Alberta High School Math Competition (for g9-g12)

2018, Ricard Kang (g12), the gold medal

2017, Ricard Kang (g11), the gold medal

2016, Richard Kang (g10), the third place; Jane Shi and Jeffrey Zhou (g11) the 5th place

2015, Jane Shi (g11), the first place, Josh Geng (g11), the third place

2014, Richard Kang (g8), the third place

Help us help students

Achieve more

- Detailed week-by-week course plan will be available at the 1st lecture; Student and parent feedback is always welcome
- You can let us know of any particular needs, e.g. if you find any concepts particularly challenging, if you want to include new topics, or if you have a plan to attend a math contest and need help with preparation
- We are here to help



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Hot lines: 403-397-8289, 403-383-6703, 403-399-5899

Principal email: allan.dong@olympicmathschool.ca