OUTLINE

1. **Course name**: MATH 789-Math enrichment for students in grades 7, 8, 9, and up.
   Lectures: Every Saturday at 2:00 PM sharp to 3:00 PM. See Yufeng Chinese School schedule for details on room number, holidays, semester start and end dates.
   Teacher: Zakhar Moyer
   Office: MS342, Department of Mathematics and Statistics, University of Calgary
   Phone: 403.869.9820
   Email: zaharmoyer1@gmail.com

2. **Prerequisites**: none

3. **Grading** (subject to changes; dates will be announced in class):
   The various components above will be assigned a grade point score and will be combined with the indicated weights to produce an overall grade point value in the course.

   Tentative component weights:
   Assignments (4) 40%
   Midterms(2) 20%
   Final Exam (1) 40%

   Tentative letter grades assignment is based off percentage:
   95-100% A+
   90-95% A
   85-90% A-
   80-85% B+
   75-80% B
   70-75% B-
   65-70% C+
   60-65% C
   55-60% C-
   50-55% D
   <50% F (Fail)

4. **Missed components of term work:**
   Can be arranged with the teacher at his discretion.

5. **Kangaroo Math Competition/Gauss Math Competition**:
   Participation in the Kangaroo Math Competition and/or the Gauss Math Competition is not mandatory but highly recommended.
   A bonus to the grade in the course may be added to the student's grade for participation in the contest; again, at the teacher's discretion.

6. **Textbooks** (Recommended, but not necessary):
   Discrete Mathematics with Applications by Susanna Epp. (Fourth edition)

7. **Subject material** (not intended to be comprehensive; may change subject according to time constraints and student interests, but is intended as a general guide):
   - Limits, divide by zero concept, functions
   -Set theory; set operations
   - Graphs
   - Maximization/ minimization; introduction to linear programming/ optimization
   - Mathematical logic
   - Probability theory, numerous applications; emphasis of set-theoretic origins
   - Group theory, inverse of elements, examples
   - Rings; ring structure; examples of finite fields
   - Cryptography, applications of finite field theory
   - Prime numbers; definitions, number field sieve
   - Mathematical models with applications to financial markets and physics
   - Definitions of market derivatives and stock derivatives pricing introduction
   -Brownian motion
   - Matrices; basic operations, applications to Markov chains in financial market models
   -Complex and imaginary numbers.
   -Extensions from set theory to the field of quaternions
   - Linear algebra, introduction to ideas of quantum mechanics
   - Newtonian physical dynamics (intuition and basic math)

   NOTE: Though the above subjects may seem advanced, all subjects are taught in a manner that can be understood by all students. Furthermore, time will be taken to ensure students are excelling in current public school concepts. This will be practical, goal-oriented, and tailored to student/class needs.

8. **Teaching goals**
   The goal of this course is to foster a enjoyment of math in the children, build upon important technical skills while also developing math “thinking” skills, and prepare the children for the Alberta School Curriculum Grades 7, 8, 9, 10, 11, 12, and up.