

# Waterloo Summer Advanced Math Program 2024

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<b>Instructor:</b>	Abdullah Zubair	<b>Class Location:</b>	UW Campus/Davis center/Dana porter library
<b>Phone number:</b>	+1 647 - 808 - 8512	<b>Class Day/Time:</b>	Sat 3:00 PM - 4:30 PM
<b>Date :</b>	June - August 2024	<b>Class Website:</b>	<a href="https://pmathe.com/">https://pmathe.com/</a>
<b>Capacity :</b>	6 students	<b>Fee:</b>	\$ 35 / session

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## Program Description:

This is a 10-week summer program for students wishing to study advanced math. Parents are encouraged to enroll their children if they are passionate and interested about learning mathematics, or if they enjoy puzzle solving and creativity. The age range is 12-15 (Grade 7 - 9); the smaller gap will help students collaborate with each other more effectively. There are no official prerequisites for the program; all relevant background knowledge will be taught or reviewed.

The structure of the program is as follows : each session will contain a lesson (according to the syllabus below) and a corresponding problem set for students to work on. Students will be encouraged to collaborate with each other and ask questions when stuck. Students will also be encouraged to challenge themselves by making problems for each other to solve. The goal for students is to enrich themselves, not necessarily engage in a competition.

If you are interested in registering your child, please **contact me** by phone number (or WhatsApp). You will be added to a group chat where I will coordinate class timings, location, homework, etc. Upon requesting I will send you a preliminary test that you can give to your child to get an idea of what types of problems he will be engaging with.

## Program Syllabus:

- **Session 1 : Logic and puzzles:** Introduction to basics of logic and puzzle solving.
- **Session 1 : Rational numbers:** Introduction to rational numbers.
- **Session 3 : Integers and prime numbers:** Introduction to integers, factorization, and primes.
- **Session 4 : Divisibility:** Introduction to the concept of divisibility (gcd and lcm).
- **Session 5 : Prime factorization:** Introduction to relationship between primes and gcd, lcm.
- **Session 6 : Modular arithmetic:** Very *brief* introduction to modular arithmetic.
- **Session 7 : Geometry I:** Basic angle properties and transversal lines.
- **Session 8 : Geometry II:** Angle properties of triangles.
- **Session 9 : Geometry III:** Chords of circles and inscribed and central angles.
- **Session 10 : Additional topic:** Additional topic based on student interest.

We will attempt to incorporate elements of computer programming to each unit if appropriate.

**REMARKS:** Students are also expected to have the following;

- Binder / Notebook.
- Basic utensils (pencils, pens, rulers, eraser, etc).
- Calculator.
- *Optional:* Laptop.