



S1IM0004C

(Token- required)

Introductory Course in  
Mathematical Olympiad

# Maths Ignition – Algebra

Instructor from International Mathematical Olympiad  
Hong Kong Committee



**Application Deadline**  
**5 Aug 2022 12:00 noon**

**Result Release**  
**26 Aug 2022**

## Intended Learning Outcomes

Upon completion of the programme, participants should be able to:

1. broaden their mathematical knowledge in the topic of Algebra on the basis of junior secondary mathematics curriculum;
2. strengthen their problem solving and higher-order thinking skills;
3. learn more about the scope of International Mathematical Olympiad Training.



## ◆ Introduction

- Maths Ignition is an introductory programme. It is designed as a series of courses on different topics and is developed as a bridging programme to the 'IMO Training' programme.
- 'Maths Ignition – Algebra' is the fourth course of the series. It aims to broaden students' knowledge in Algebra on the basis of junior secondary mathematics curriculum through exploration and investigation approach. Students who have completed 2 out of 5 courses in Maths Ignition series might be considered for direct admission to the 'Introduction to Olympiad Mathematics 2023 (Phase I)' (E1IM0008C), an intermediate-level programme offered by IMO Hong Kong Committee.
- This programme is co-organized with International Mathematical Olympiad Hong Kong Committee (IMOHKC)

## ◆ Target Participants

- S1 to S3 HKAGE student members
- Class size: 30
- All applicants **MUST** attend the Aptitude Test held in HKAGE on 20 Aug 2022 except for those who have attended the Aptitude Test held on 20 Nov 2021, 19 Feb 2022, or 14 May 2022

\* Not for students who have enrolled in:

1. CGMO Training (Phase I) ( E1IM0007C ) or
2. Introduction to Olympiad Mathematics (Phase I) ( E1IM0008C ) or
3. Any phase of International Mathematics Olympiad (IMO) Training before.

Remarks:

- Due to the limited seats in computer rooms, students who have attended the Aptitude Test on 14 May 2022 would not be allowed to take the test on 20 Aug 2022. Their results on 14 May 2022 will be used for this programme.
- Students will be selected randomly in attending the Aptitude Test if the application is over-subscribed. Only selected students could join the Aptitude Test held on 20 Aug 2022.
- A notification email will be sent on 11 Aug 2022 for the application result of the Aptitude Test.
- All unselected students will be regarded as their application of this programme unsuccessful.

This programme is same as "Introductory Course in Mathematical Olympiad: Maths Ignition – Algebra (E1IM0004C)" in 21/22 school year.

## ◆ Medium of Instruction

Cantonese with English handouts



## ◆ Aptitude Test

- Students who wish to apply for this programme must take a general aptitude test on **20 Aug 2022 (1:45 p.m. – 3:45 p.m. or 4:00 p.m. – 6:00 p.m.)**, except for those who have attended the Aptitude Test held on 20 Nov 2021, 19 Feb 2022, or 14 May 2022.
- This general aptitude test consists of 100 multiple choice questions which covers a wide range of topics in mathematics. The purpose of the test is to figure out the applicant's knowledge in different fields of mathematics in order to choose the most suitable students for different programmes. Neither under-qualified nor over-qualified students will be admitted.
- The next aptitude test is tentatively scheduled on **19 Nov 2022**. The result of an aptitude test will be valid for one year. If a student takes the test more than once, the latest result will prevail. The following table lists the programmes for which the results of this general aptitude test will apply.

Programme Date	Code	Programme Name	Aptitude test valid			
			20 Nov 2021	19 Feb 2022	14 May 2022	20 Aug 2022
Sep 2022	S1IM0003C	Maths Ignition - Number Theory	✓	✓	✓	✓
Nov 2022	S1IM0004C	Maths Ignition - Algebra	✓	✓	✓	✓
Feb 2023	S1IM0005C	Maths Ignition - Coordinate Geometry		✓	✓	✓
Mar 2023	S1IM0007C	CGMO Training 2023 (Phase I)			✓	✓
Mar 2023	S1IM0008C	Introduction to Olympiad Mathematics 2023 (Phase I)			✓	✓
Jul 2023	S1IM0001C	Maths Ignition - Combinatorics				✓
Aug 2023	S1IMo002C	Maths Ignition - Geometry				✓

### Remarks:

1. All aptitude tests will only be arranged on the designated dates. No make-up test will be arranged.
2. No Calculator is allowed.
3. Please bring along with your Identification Card, e.g. HKID, student ID.
4. Please arrive at the venue 15 minutes prior to the Aptitude Test begins.

If students who have selected to join the aptitude test are absent without any reasons and prior notification provided, it will result in a lower priority in joining the aptitude test next time when they apply.



## ◆ Schedule

Session	Date	Time	Venue
Aptitude Test	20 Aug 2022	1:45 p.m. – 4:00 p.m. OR 4:00 p.m. – 6:00 p.m.	Welkin Systems Limited, 7/F, Righteous Centre, 585 Nathan Road, Mongkok ( <a href="#">MAP</a> )
1	26 Nov	2:00 p.m. – 5:00 p.m.	Room 203, HKAGE
2	3 Dec		Room 203, HKAGE
3	10 Dec		Room 203, HKAGE
4	17 Dec		Room 203, HKAGE

- A notification email will be sent on **11 Aug 2022** for the application result of the Aptitude Test.
- For any assessment to be held in the programme, **no make-up** will be arranged.

## ◆ Certificate

E-Certificate will be awarded to participants who have:

- attended **at least 3 sessions**; and
- completed all the assignments with satisfactory performance

## ◆ Sample Notes

1. Without using a calculator, find  $\sqrt[3]{8030}$  correct to 3 decimal places.
2. Let  $a$  be a real number such that  $a^2 - a - 1 = 0$ . Find the value of  $a^4 - a^3 + a^2 - 2a + 2016$ .



## ◆ Appendix - IMO-related Programmes

- IMO-related programmes is a series of programmes that provide International Mathematics Olympiad (IMO) related training. It aims to equip students with the mathematics knowledge and curriculum of IMO, problem solving skills, and high-order thinking skills progressively.
- The programmes are divided into three levels: Introductory, Intermediate, and Advanced level.
- There are different enrollment methods, e.g. aptitude test. For details, please refer to each programme's poster

### Introductory Level

#### Maths Ignition (MI) Programmes

- For S1-S3 HKAGE student members
- Introductory training in Mathematical Olympiad by topics
- Application for five MI programmes will be open in Apr, Jul & Oct each year
- Enroll through aptitude test

### Introductory to Intermediate Level

#### Introduction to Olympiad Mathematics (ITOM)

- For S1-S6 HKAGE student members
- Two phases of training
- Application will be open in Jan each year
- Enroll through aptitude test
- Students who have completed at least 2 MI programmes could enroll directly

### Introductory to Advanced Level

#### China Girls Mathematics Olympiad (CGMO) Trainings

- For S1-S6 HKAGE female HKAGE student members
- Three phases of training
- Application will be open in Jan each year
- Enroll through aptitude test
- CGMO HK Team members will be selected based on their performance in the trainings

### Advanced Level

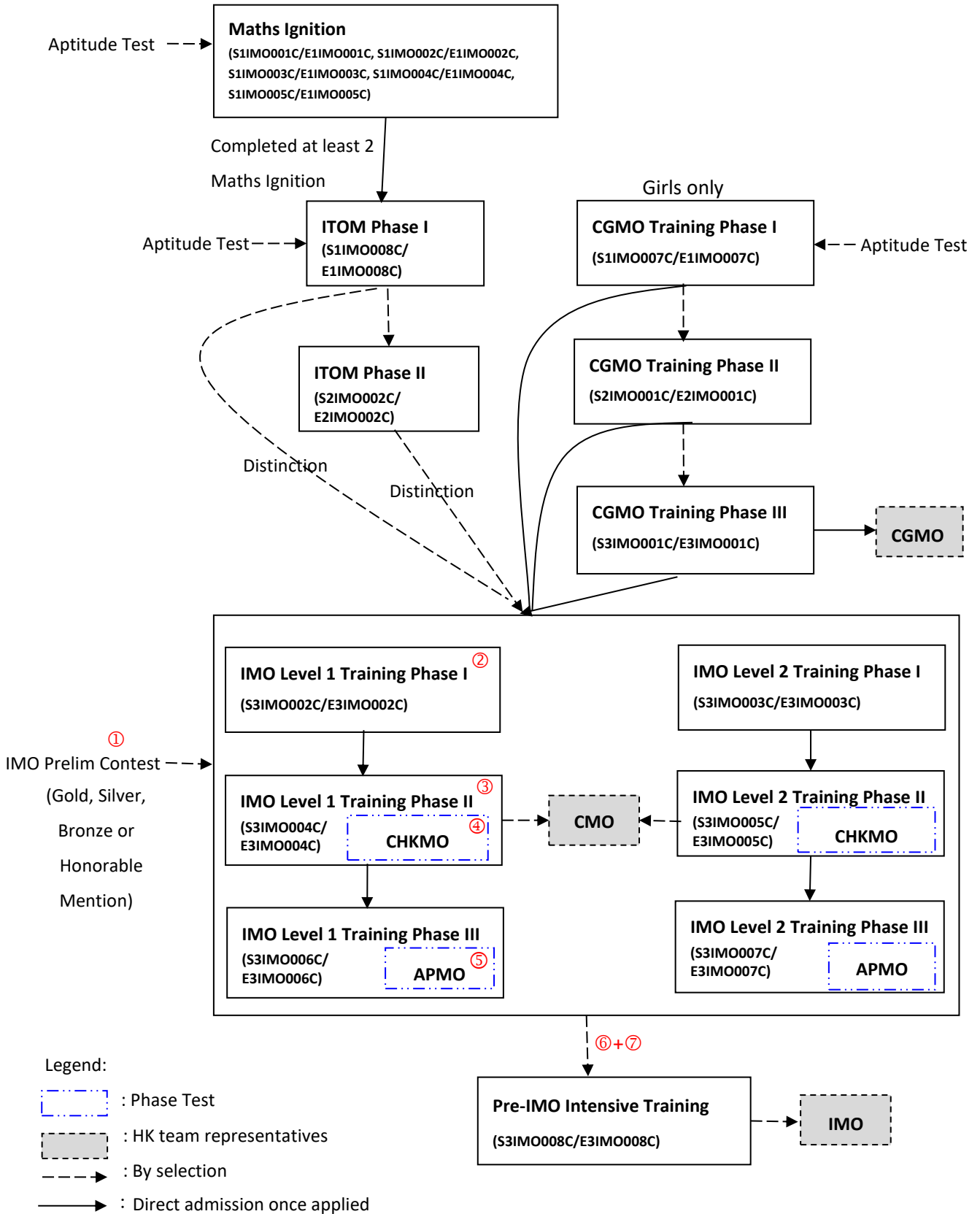
#### International Mathematics Olympiad (IMO) Trainings

- For all awardees of IMO Preliminary Selection Contest - Hong Kong; OR students who got the certificate of distinction in any phases of ITOM training; OR students who have completed any phases of CGMO training
- Three phases of training
- IMO HK Team members will be selected based on their performance in the trainings and IMO Preliminary Selection Contest - Hong Kong

\*Detail flowchart and timeline, please refer to next page.

\*\*For timetable of MI programmes, ITOM, and CGMO in coming year, please refer to section "Aptitude Test" of this poster.

## International Mathematical Olympiad Related Programmes



**Remarks:**

ITOM – Introduction to Olympiad Mathematics  
 CGMO – China Girl’s Mathematical Olympiad  
 IMO – International Mathematical Olympiad

CHKMO – Hong Kong (China) Mathematical Olympiad  
 CMO – Chinese Mathematical Olympiad  
 APMO – Asian Pacific Mathematics Olympiad

IMO HK Team representatives are selected based on their performance in the assessments from ① through ⑦

# IMPORTANT information for International Mathematical Olympiad (IMO) Training

<b>Phase Trainings</b>			
<b>Eligibility</b>			
<ul style="list-style-type: none"> <li>● IMO Preliminary Selection Contest awardees ① or</li> <li>● Student members who have been a trainee in any phase of the IMO Training or</li> <li>● Student members who have completed any phase of CGMO Training or</li> <li>● Student members who have completed any phase of ITOM Training with Distinction</li> </ul>			
Training /Competition	Content	Excepted Schedule	Remark
<b>Phase I Training</b>	13 x 3-hr lessons	Jul - Aug	
	Test 1 ② 3 hr, 6 proof problems	Aug	✧ Phase test ✧ No make-up test
<b>Phase II Training</b>	17 x 3-hr lessons	Sep - Dec	
	Test 2 ③ 3 hr, 4 proof problems	Oct	✧ Phase test ✧ No make-up test
	CHKMO ④ 3 hr, 4 proof problems	Dec	✧ Phase test ✧ No make-up tests
<b>CMO</b>	2 days x 4.5 hr, 3 proof problems	Dec or Jan	6# students selected based on Prelim ①, Test 1 ②, and Test 2 ③
<b>Phase III Training</b>	8 x 3-hr lessons	Jan - Mar	
	APMO ⑤ 4 hr, 5 proof problems	Mar	✧ End-of-phase test ✧ No make-up test
<b>Selection Tests for Pre-IMO Intensive Training</b>	Test 3 ⑥ 4.5 hr, 3 proof problems Test 4 ⑦ 4.5 hr, 3 proof problems	Apr or May	18 students selected based on Prelim ①, Test 1 ②, Test 2 ③, CHKMO ④ and APMO ⑤  ✧ No make-up tests
<b>Pre-IMO Intensive Training</b>	IMO HK Team (6 students) & Alternate Team (6 students),		12 students selected based on Prelim ①, Test 1 ②, Test 2 ③, CHKMO ④, APMO ⑤, Test 3 ⑥ and Test 4 ⑦
<b>IMO</b>	2 days x 4.5 hr, 3 proof problems @		IMO HK Team
<b>CGMO</b>	2 days x 4 hr, 4 proof problems @		8# female students selected via CGMO Training (NOT IMO Training)

# Subject to change. May vary from year to year.

IMO HK Team representatives are selected based on their performance in the assessments from ① through ⑦

## Useful websites

IMO official website:	<a href="http://www.imo-official.org">www.imo-official.org</a>
IMO 2017 website:	<a href="http://www.imo2017.org.br/">http://www.imo2017.org.br/</a>
Art of Problem Solving:	<a href="http://www.artofproblemsolving.com">www.artofproblemsolving.com</a>
Mathematical Database:	<a href="http://www.mathdb.org">www.mathdb.org</a>
IMO 2016 Facebook page:	<a href="https://www.facebook.com/imo2016">www.facebook.com/imo2016</a>
IMO 2016 newsletter IMOment:	<a href="http://www.edb.gov.hk/tc/curriculum-development/kla/ma/IMO/IMOment.html">www.edb.gov.hk/tc/curriculum-development/kla/ma/IMO/IMOment.html</a>
Mathematical Excalibur:	<a href="http://www.math.ust.hk/excalibur/">www.math.ust.hk/excalibur/</a>
reference list recommended by IMOHKC	<a href="https://docs.google.com/spreadsheets/d/1I4GNYbY2eDPPKCnD4lpnYuqNenJV0-3NgKUMDh6m5ow/edit?usp=sharing">https://docs.google.com/spreadsheets/d/1I4GNYbY2eDPPKCnD4lpnYuqNenJV0-3NgKUMDh6m5ow/edit?usp=sharing</a>