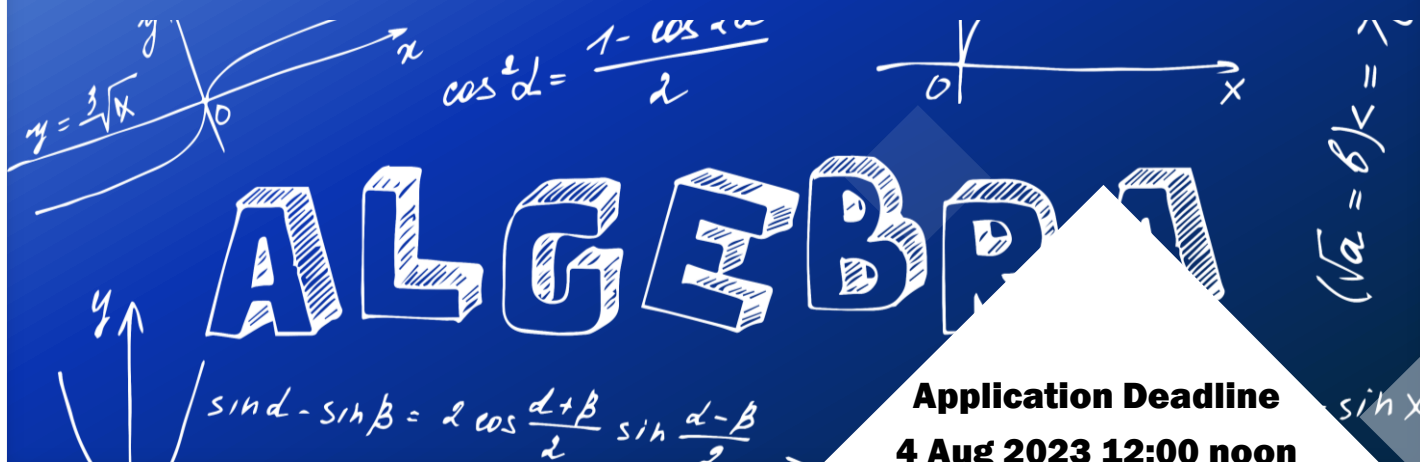S1IMO004C

(Token- required)

Introductory Course in Mathematical Olympiad

Maths Ignition – Algebra

Instructor from International Mathematical Olympiad Hong Kong Committee

**Application Deadline
4 Aug 2023 12:00 noon**

**Result Release
25 Aug 2023**

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.

If student members withdraw from the programme after the Application Deadline, the token will be deducted.

◆ 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 might be considered for direct admission to the 'Introduction to Olympiad Mathematics 2024 (Phase I)' (S1IMO008C) , an intermediate-level programme offered by IMO Hong Kong Committee if attained:
  (a) distinction in 2 MI courses; OR
  (b) merit or above in 3 MI courses; OR
  (c) completion or above in 4 MI courses

- 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 <u>19 Aug 2023</u> except for those who have attended the Aptitude Test held on 19 Nov 2022, 18 Feb 2023, or 13 May 2023

* Not for students who have enrolled in:
1. CGMO Training (Phase I) （E1IMO007C/S1IMO007C） or
2. Introduction to Olympiad Mathematics (Phase I) （E1IMO008C/S1IMO008C） 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 13 May 2023 would not be allowed to take the test on 19 Aug 2023. Their results on 13 May 2023 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 19 Aug 2023.
- A notification email will be sent on 10 Aug 2023 for the application result of the Aptitude Test.
- All unselected students will be regarded as their application of this programme unsuccessful.

This programme is the same as "Introductory Course in Mathematical Olympiad: Maths Ignition – Algebra (E1IMO004C/S1IMO004C)" in 21/22 and 22/23 school year.

◆ Medium of Instruction

Cantonese with English handouts

◆ Enquiries   📞 3940 0101   ✉ programme@hkage.org.hk

◆ Aptitude Test

- Students who wish to apply for this programme must take a general aptitude test on **19 Aug 2023 (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 19 Nov 2022, 18 Feb 2023, or 13 May 2023.

- 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 **18 Nov 2023**. 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			
			19 Nov 2022	18 Feb 2023	13 May 2023	19 Aug 2023
Sep 2023	S1IMO003C	Maths Ignition - Number Theory	✓	✓	✓	✓
Nov 2023	S1IMO004C	Maths Ignition - Algebra	✓	✓	✓	✓
Feb 2024	S1IMO005C	Maths Ignition - Coordinate Geometry		✓	✓	✓
Mar 2024	S1IMO007C	CGMO Training 2024 (Phase I)			✓	✓
Mar 2024	S1IMO008C	Introduction to Olympiad Mathematics 2024 (Phase I)			✓	✓
Jul 2024	S1IMO001C	Maths Ignition – Combinatorics				✓
Aug 2024	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.

◆ **Enquiries** 📞 3940 0101 ✉ programme@hkage.org.hk

◆ Schedule

Session	Date	Time	Venue
Aptitude Test	19 Aug 2023	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 (MAP) (To be confirmed)
1	25 Nov	2:00 p.m. – 5:00 p.m.	HKAGE
2	2 Dec		
3	9 Dec		
4	16 Dec		

- A notification email will be sent on <u>10 Aug 2023</u> 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 $a^4 - a^3 + a^2 - 2a + 2016$.

◆ Enquiries 📞 3940 0101 ✉ programme@hkage.org.hk

◆ Appendix - IMO-related Programmes (1 Sep 2023 onwards)

- IMO-related programmes is a series of programmes that provide International Mathematical 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

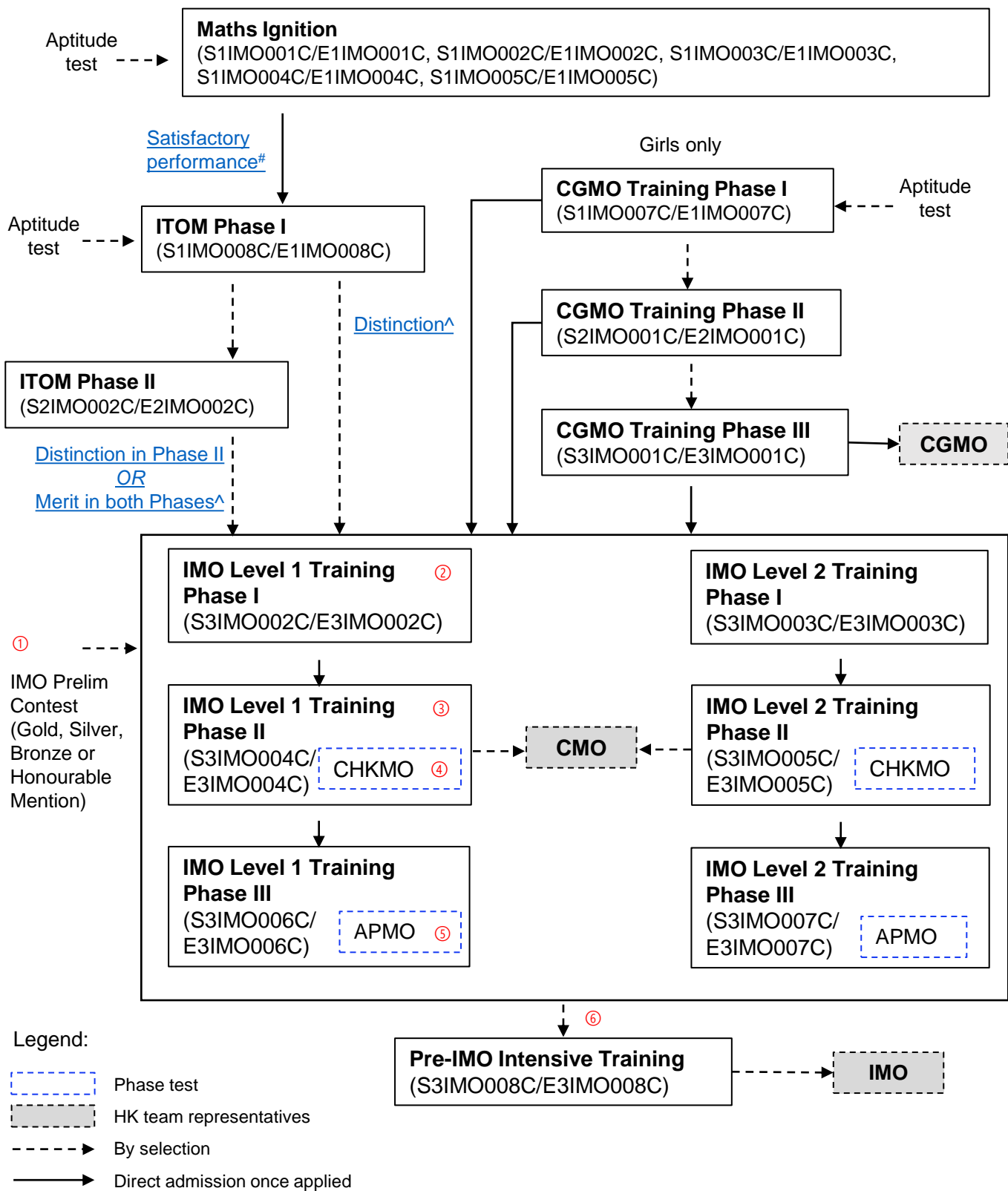|		
Introductory Level	**Maths Ignition (MI) Programmes**	• For S1-S3 HKAGE student members • Introductory training in Mathematical Olympiad by topics • Application for five MI programmes will be open in Apr, Jul & Oct each year • Enroll through **aptitude test**
Introductory to Intermediate Level	**Introduction 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; OR** • Students who attained (a) distinction in 2 MI courses; OR (b) merit or above in 3 MI courses; OR (c) completion or above in 4 MI courses 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; OR** • Students who have completed any phase of IMO/CGMO/ITOM Training could enroll directly • CGMO HK Team members will be selected based on their performance in the trainings
Advanced Level	**International Mathematical Olympiad (IMO) Trainings**	• For all awardees of IMO Preliminary Selection Contest - Hong Kong; OR students who got the certificate of distinction in any phase of ITOM training; OR students who got the certificate of merit in both phases of ITOM training; OR students who have completed any phase of IMO/CGMO training • Four phases of training • IMO HK Team members will be selected based on their performance in the tests and trainings

*For detailed flowchart and timeline, please refer to the next page.

◆ **Enquiries** 📞 3940 0101   ✉ programme@hkage.org.hk

International Mathematical Olympiad Related Programmes

（English version only 只提供英文版）

Maths Ignition
(S1IMO001C/E1IMO001C, S1IMO002C/E1IMO002C, S1IMO003C/E1IMO003C,
S1IMO004C/E1IMO004C, S1IMO005C/E1IMO005C)

Aptitude test - - - ▶

Satisfactory performance#

Aptitude test - - - ▶ **ITOM Phase I** (S1IMO008C/E1IMO008C)

Girls only

CGMO Training Phase I (S1IMO007C/E1IMO007C) ◀ - - - Aptitude test

CGMO Training Phase II (S2IMO001C/E2IMO001C)

Distinction^

ITOM Phase II (S2IMO002C/E2IMO002C)

CGMO Training Phase III (S3IMO001C/E3IMO001C) → **CGMO**

Distinction in Phase II
OR
Merit in both Phases^

IMO Level 1 Training Phase I ② (S3IMO002C/E3IMO002C)

IMO Level 2 Training Phase I (S3IMO003C/E3IMO003C)

① - - - ▶

IMO Prelim Contest (Gold, Silver, Bronze or Honourable Mention)

IMO Level 1 Training Phase II ③ (S3IMO004C/ E3IMO004C) | CHKMO ④

CMO

IMO Level 2 Training Phase II (S3IMO005C/ E3IMO005C) | CHKMO

IMO Level 1 Training Phase III (S3IMO006C/ E3IMO006C) | APMO ⑤

IMO Level 2 Training Phase III (S3IMO007C/ E3IMO007C) | APMO

⑥

Pre-IMO Intensive Training (S3IMO008C/E3IMO008C) - - - ▶ **IMO**

Legend:

- - - - (dashed blue box) Phase test
- - - - (dashed grey box) HK team representatives
- - - - ▶ By selection
━━━━▶ Direct admission once applied

Remarks:

ITOM – Introduction to Olympiad Mathematics   CHKMO – Hong Kong (China) Mathematical Olympiad
CGMO – China Girl's Mathematical Olympiad   CMO – Chinese Mathematical Olympiad
IMO – International Mathematical Olympiad   APMO – Asian Pacific Mathematics Olympiad

IMO2024 HK Team representatives are selected based on their performance in the assessments from ① through ⑥
IMO2025 HK Team representatives are selected based on their performance in the assessments from ② through ⑥

IMPORTANT information for International Mathematical Olympiad (IMO) Training

IMO Training

Eligibility
- IMO Preliminary Selection Contest awardees ① or
- Student members who have completed any phase of the IMO Training or
- Student members who have completed any phase of CGMO Training or
- Student members who have completed any phase of ITOM Training with Distinction
- Student members who have completed both phases of ITOM Training with Merit

Training /Competition	Content	Tentative schedule	Remark
Phase I Training	13 x 3-hr lessons	Jul - Aug	
	Test 1 ② 3 hr, 6 proof problems	Aug	▪ Phase test ▪ No make-up test
Phase II Training	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 test
Phase III Training	8 x 3-hr lessons	Jan - Mar	
	APMO ⑤ 4 hr, 5 proof problems	Mar	▪ End-of-phase test ▪ No make-up test
Selection Tests for Pre-IMO Intensive Training	Test 3 ⑥ 2 days x 4.5 hr, 3 proof problems	Apr or May	▪ About 20 students to be selected based on previous tests ▪ No make-up tests
Pre-IMO Intensive Training	IMO HK Team (6 students) & Alternate Team (6 students)		▪ 12 students to be selected based on previous tests
IMO	2 days x 4.5 hr, 3 proof problems		▪ IMO HK Team
CMO	2 days x 4.5 hr, 3 proof problems		▪ About 6 students to be selected based on previous tests
CGMO	2 days x 4 hr, 4 proof problems		▪ About 8 female students selected via CGMO training

IMO2024 HK Team representatives are selected based on their performance in the assessments from ① through ⑥
IMO2025 HK Team representatives are selected based on their performance in the assessments from ② through ⑥

Useful websites

IMO official website:	http://www.imo-official.org/
IMO website:	http://imo2023.jp/
Art of Problem Solving:	http://www.artofproblemsolving.com/
Mathematical Excalibur:	http://www.math.ust.hk/excalibur/

#Entering ITOM with Satisfactory Performance in Maths Ignition (MI) Programmes

Starting from 1 September 2023 onwards, students who fulfilled one of the criteria below are eligible to enter ITOM - "Introduction to Olympiad Mathematics (Phase I)" (S1IMO008C):
- good results in aptitude test; OR
- distinction in at least 2 different MI courses; OR
- merit/distinction in at least 3 different MI courses; OR
- pass/merit/distinction in at least 4 different MI courses

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^Entering IMO Training with Satisfactory Performance in ITOM or CGMO

Starting from 1 September 2023 onwards, students who fulfilled one of the criteria below are eligible to enter IMO training Phase I Level I (S3IMO002C):
- Non-HKAGE student members / HKAGE student members who were awarded Honourable Mention or above in IMO Preliminary Selection Contest – Hong Kong; OR
- HKAGE student members who have completed any phase International Mathematical Olympiad (IMO) Training; OR
- HKAGE student members who have completed any phase of CGMO; OR
- HKAGE student members who have attained distinction in any phase of ITOM; OR
- HKAGE student members who have attained merit in both phases of ITOM

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