



S1IM0008C

(Token- required)

Intermediate Course in  
Mathematical Olympiad

# Introduction to Olympiad Mathematics 2023 (Phase I)

Instructor from International Mathematical Olympiad  
Hong Kong Committee

INTRODUCTION TO  
OLYMPIAD  
MATHEMATICS

Phase I



**Application Deadline**  
**31 Jan 2023 12:00 n.n**

**Result Release**  
**24 Feb 2023**

## Intended Learning Outcomes

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

1. broaden mathematical knowledge in a variety of areas on the basis of senior secondary mathematics curriculum
2. strengthen the problem solving and higher-order thinking skills
3. learn more about the scope of International Mathematical Olympiad Training



## ◆ Introduction

- An introductory level comprehensive mathematics programme which covers a wide range of topics
- Broaden students' mathematical knowledge and strengthen their problem-solving skills
- Students can learn more about the scope of International Mathematical Olympiad Training
- Consists of 2 phases

This programme is co-organized with International Mathematical Olympiad Hong Kong Committee (IMOHKC)

## ◆ Target Participants

- S1 to S6 HKAGE student members
- Class size: 30

All applicants **MUST** attend the **Aptitude Test** held on **18 Feb 2023**.

Except for those who have

- a) completed any 2 out of 5 courses in Maths Ignition series **OR**
- b) attended the Aptitude Test held on 14 May 2022, 20 Aug 2022 or 19 Nov 2022

**Remarks: Not for student members who have completed any phase of "International Mathematics Olympiad Training" or "Introduction to Olympiad Mathematics" before**

Remarks:

- Due to the limited seats in computer rooms, students who have attended the Aptitude Test on 19 Nov 2022 would not be allowed to take the test on 18 Feb 2023. Their results on 19 Nov 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 18 Feb 2023.
- A notification email will be sent on **8 Feb 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 Introduction to Olympiad Mathematics 2020 (Phase I) (MATS1151) in 19/20 school year and Introduction to Olympiad Mathematics 2022 (Phase I) (E1IM0008C) in 21/22 school year.

## ◆ Medium of Instruction

Cantonese with English handouts

## ◆ Pre-requisite

Students should know the basic knowledge of the following:

Quadratic Equations and Functions, Binomial Theorem, Mathematical Induction, Remainder Theorem and Factor Theorem, Arithmetic and Geometric Sequences, Circles and Trigonometry



## ◆ Aptitude Test

- Students who wish to apply for this programme must take a general aptitude test on **18 Feb 2023 (2:00 p.m. – 4:00 p.m.)**. Except for those who have attended the Aptitude Test held on 14 May 2022, 20 Aug 2022 or 19 Nov 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 **13 May 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 |             |             |             |
|----------------|-----------|---|---------------------|-------------|-------------|-------------|
|                |           |   | 14 May 2022         | 20 Aug 2022 | 19 Nov 2022 | 18 Feb 2023 |
| 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       | S1IM0002C | Maths Ignition - Geometry                           |                     | ✓           | ✓           | ✓           |
| Sep 2023       | S1IM0003C | Maths Ignition - Number Theory                      |                     |             | ✓           | ✓           |
| Nov 2023       | S1IM0004C | Maths Ignition - Algebra                            |                     |             | ✓           | ✓           |

### 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.

## ◆ Certificate

E-Certificate will be awarded to participants who have:

- attended **at least 7 sessions**; and
- completed all the assignments with satisfactory performance



## ◆ Schedule

| Session       | Date        | Time                  | Venue   |
|---------------|-------------|-----------------------|---|
| Aptitude Test | 18 Feb 2023 | 2:00 p.m. – 4:00 p.m. | Welkin Systems Limited, 7/F, Righteous Centre, 585 Nathan Road, Mongkok ( <a href="#">MAP</a> ) |
| 1             | 4 Mar       | 2:00 p.m. – 5:30 p.m. | HKAGE (TBC)   |
| 2             | 11 Mar      |                       |   |
| 3             | 18 Mar      |                       |   |
| 4             | 25 Mar      |                       | Room 303, HKAGE   |
| 5             | 1 Apr       |                       |   |
| 6             | 15 Apr      |                       |   |
| 7             | 22 Apr      |                       |   |
| 8             | 29 Apr      |                       |   |
| 9             | 6 May       |                       |   |

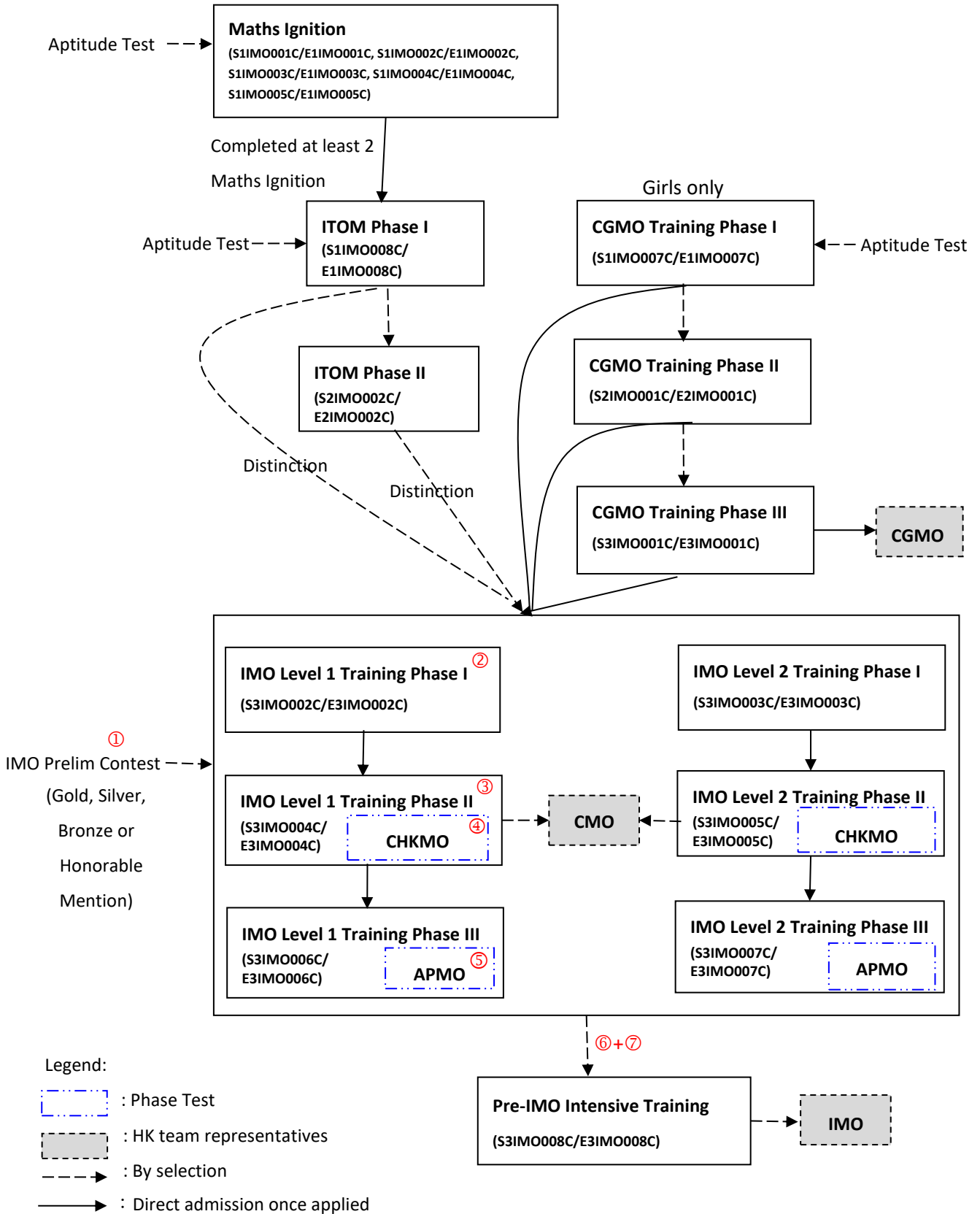
- For any assessment to be held in the programme, **no make-up** will be arranged.

## ◆ Sample Notes

1. Does there exist a multiple of 2017 of the form 111...111?
2. If  $a + b + c = 10$ , what is the greatest possible value of  $ab^2c^3$ ?



## 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<br>✧ 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<br>✧ No make-up test  |
|  | CHKMO ④ 3 hr, 4 proof problems   | Dec               | ✧ Phase test<br>✧ 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<br>✧ No make-up test   |
| <b>Selection Tests for Pre-IMO Intensive Training</b>  | Test 3 ⑥ 4.5 hr, 3 proof problems<br>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<br><br>✧ No make-up tests |
| <b>Pre-IMO Intensive Training</b>  | IMO HK Team (6 students)<br>& 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="http://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> |