

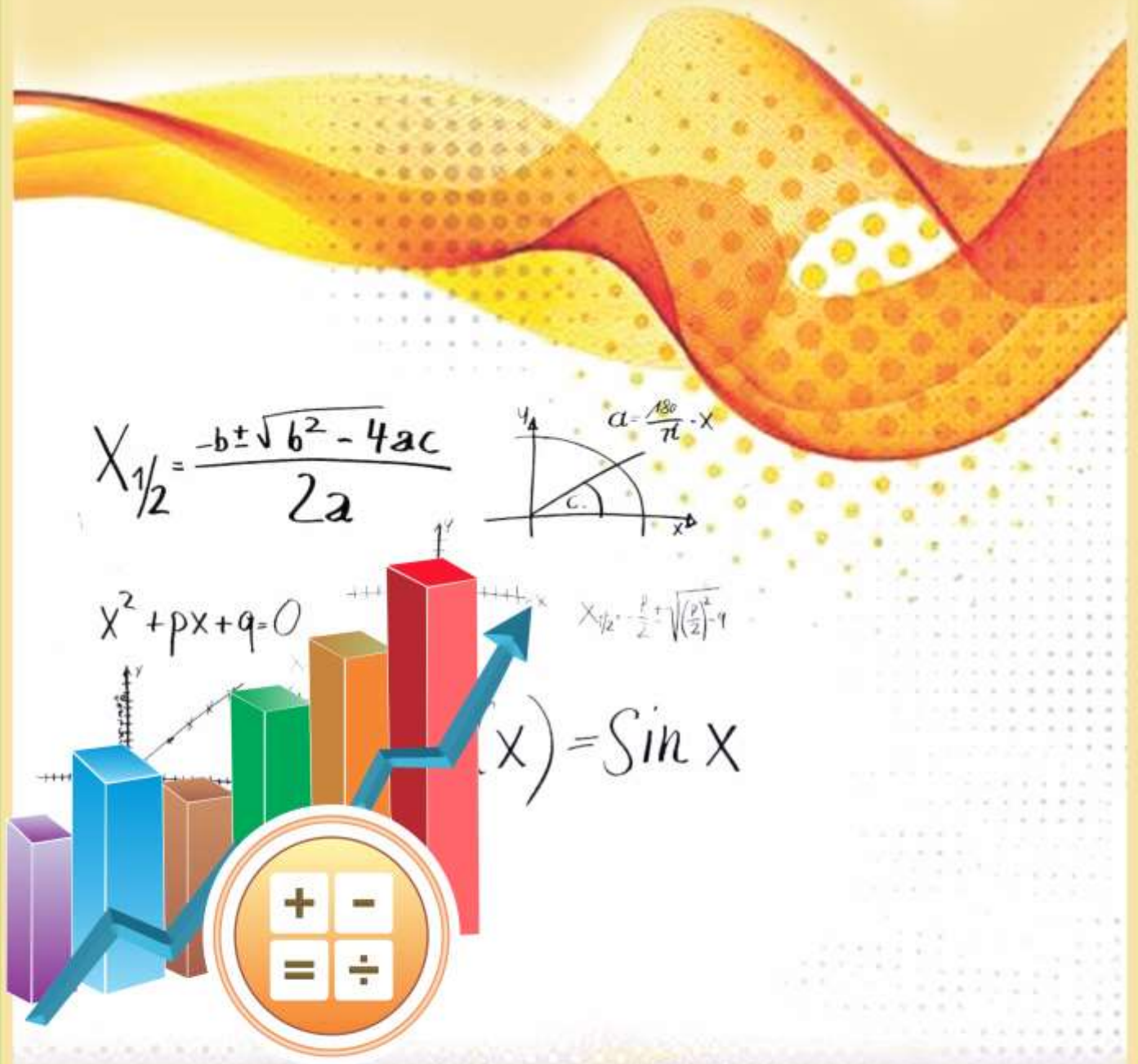


ITMO

INTERNATIONAL TEENAGERS MATHEMATICS OLYMPIAD

2019 INDIA

Gomti Nagar Campus I, Lucknow, India



International young critical and analytical thinkers compete in friendly rivalry to solve Mathematical Question.

Date: 13th to 17th October 2019

**2019 INTERNATIONAL TEENAGERS MATHEMATICS OLYMPIAD
(ITMO 2019)**

13-17, October 2019

City Montessori School, Gomti Nagar Campus - I, Lucknow India

OFFICIAL INVITATION

Dear Colleagues:

We take great pleasure to invite your country to send students to participate in the 2019 **International Teenagers Mathematics Olympiad (ITMO)** organized by the *City Montessori School, Gomti Nagar Campus-I*, Lucknow in coordination with the *Government of Uttar Pradesh under the supervision of the International Mathematics Competition (IMC) Executive Board.*

The 2019 ITMO aims to

- a) Provide young students the opportunity to communicate mathematical ideas and reasoning through competition;
- b) Present an avenue for mathematical interaction and foster camaraderie and friendship among youths of the world; and
- c) Improve students' higher order thinking skills through games and problem solving.
- d) Provide a supportive and stimulating environment for mathematics, innovation and education
- e) Establish networks with international educational organizations for the development of teaching and learning of mathematics

The participation in the ITMO 2019 is by invitation. Each invited country can send participants:

- a. **Key Stage 2**
 - a maximum of two (2) teams, regardless a country was a previous host of IMC or ITMO.
- b. **Key Stage 3**
 - Two (2) teams if a country has never been a host of IMC or ITMO
 - Up to four (4) teams if a country was a host of IMC or ITMO.

NOTE: Each team consists of a leader, a deputy leader and exactly four contestants.

We will take charge of all official expenses for only 2 teams in the Key Stage 2 and 2 teams in the Key Stage 3 including accommodation, meals, and sightseeing during the

official period of the competition from 13th to 17th of October 2019 in Lucknow, India. However, the organizer will be responsible for the 4 teams of the Key Stage 3 of the following countries for being the former host countries: Bulgaria, China, Hong Kong, India, Indonesia, Macau, Malaysia, Nepal, Philippines, South Africa, South Korea, Taiwan and Thailand, as they had been the former hosts for organizing different activities under the supervision of IMC Executive Board.

Each participating team is responsible for the travelling expenses (including visa fees and other expenses for their arrival and departure to and from India) from their homeland to Lucknow, Chaudhary Charan Singh International Airport.

Attached herein is the detailed Guidelines and Information of the 2019 ITMO. The application form and other requests should be submitted to us via e-mail on or before the deadline as indicated in the information brochure.

Welcome to Lucknow, India for the 2019 ITMO.

Thank you.

2019 INTERNATIONAL TEENAGERS MATHEMATICS OLYMPIAD

Guidelines and Information

I. The History and Aims:

The International Mathematics contest came into reality in 2003. After the SARS outbreak in Eastern Asia, most of the International Mathematics contests hosted by selected countries were all either postponed or cancelled. Meanwhile, the preparations made by participating countries were all in-place. The opportunity for the students to prove their effort after a year of rigid training was in vain. Hence, Dr. Simon L. Chua, the president of the Mathematics Trainers' Guild, Philippines, presented a proposal to the concerned leaders of the different countries to pursue the contest by searching for a new venue. Such proposal earned an overwhelming support from the Board Chairman of Taiwan Chiu Chang Mathematics Education Foundation, Mr. Sun Wen-hsien and the Principal of the Hong Kong Math Olympiad School, Madam Pinky Leung.

Fortunately, through the cooperation of former Vice Chairman of the Chinese Mathematics Society Popularization Working Committee, Mr. QiuZonghu and the Principal of Fuzhou No. 1 Middle School, Mr. Li Xun, the 2003 Asian Inter-Cities Teenagers Mathematics Olympiad (AITMO) was made possible in August, 2003 at the West Lake Hotel, Fuzhou, China.

After the success of the Math contest, the AITMO founder leaders from these countries and regions, China, Philippines, Taiwan and Hong Kong met to plan the future of AITMO. They decided to make this Math contest a biannual event.

Moreover, several countries had been interested to join AITMO but were restricted because the contest was limited only to Asian participants. Inspired by the overwhelming response of different countries to participate in the competitions, the founder leaders opened AITMO to the world and renamed the contest to International Teenagers Mathematics Olympiad (ITMO) which was held in Sungai Petani, Kedah, Malaysia in December 2015.

In 2017 International Teenagers Mathematics Olympiad (ITMO 2017) was conducted by Mathematics Trainer's Guild (MTG) Philippines at Davao City from 8th November to 12th November, 2017.

This year, India is chosen to be the host of the 2019 ITMO and City Montessori School, Gomti Nagar Campus I, Lucknow as the local ITMO Ongoing Committee. ITMO 2019 will be organized by City Montessori School, Gomti Nagar Campus I, Lucknow, the State Capital of Uttar Pradesh, India from 13th October to 17th October 2019.

II. 2019 ITMO Participation:

Participation in the ITMO 2019 is by invitation. Each invited country can send participants.

- a. Key Stage 2- a maximum of two (2) teams, regardless if a country was a previous host of IMC or ITMO;
- b. Key Stage 3 - Two (2) teams if a country has never been a host of IMC or ITMO - Up to four (4) teams if a country was a previous host of IMC or ITMO.

NOTE: Each team consists of a leader, a deputy leader and exactly four contestants.

III. Important Dates:

Participation in the ITMO 2019 is by invitation. Each invited country can send participants:

- a. Date and Venue:
•**13th to 17th October, 2019** City Montessori School Lucknow, India
- b. Date of Confirmation of Participation:
•Not later than **30th May, 2019**

- c. Submission of Application Form:
 - Not later than **1st June, 2019**
- d. Submission of Proposed Problems:
 - Not later than **15th June, 2019**
- e. Submission of the list of Delegates and their Flight details:
 - Not later than **15th September, 2019**

IV. Participants' Eligibility:

Contestants must have been born:

- Key Stage 2 - on or after 13th October 2006
 - Key Stage 3 - on or after 13th October 2003 and should not have enrolled in the Senior High School or equivalent institutions.
- c. Students should submit a school certificate for the verification of age Key Stage 2- a maximum of two (2) teams, regardless if a country was a previous host of IMC or ITMO;
- d. Key Stage 3 - Two (2) teams if a country has never been a host of IMC or ITMO - Up to four (4) teams if a country was a previous host of IMC or ITMO.

NOTE: Each team consists of a leader, a deputy leader and exactly four contestants.

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V. Official Language:

- **Key Stage 3 - Only English** is the official language.
- **Key Stage 2** - English but translation of Key word to one's language is allowed for countries if they find it necessary.

VI Expenses:

1. The organizer will take charge of all official expenses of only 2 teams in each division, that include accommodations, meals, and sightseeing during the official period of the 2019 ITMO, 13-17, October 2019 in City Montessori School Lucknow, the State Capital of Uttar Pradesh, India.

2. However, the organizer will be responsible for all official expenses of the 4 teams of the Key Stage 3, due to their status as the former IMC/ITMO hosts countries: Bulgaria, China, Hong Kong, India, Indonesia, Macau, Malaysia, Nepal, Philippines, South Africa, South Korea, Taiwan and Thailand.
3. Additional/excess participants, observers, parents and other accompanying persons have to pay **US\$ 650.00** for the accommodation, meals, transportation, and sightseeing during the period of official competition.

VII. Cultural Presentation:

- Each participating team must prepare three to five minutes ethnic number to be presented during the Cultural Night. A dance or song sequence or a short skit in an ethnic dress unique to their country or region will ideally suit the cultural function. The presentations will be judged and the best ones will receive a **cash award**.
- Each participating team must bring the national flag for the opening ceremony and procession. Dimension of the flag must be 1m by 1.5m.

VIII. Early Arrival and Late Departure:

- Participants and delegations arriving before or leaving after the official ITMO period, i.e. 13th to 17th October, 2019, are responsible for their expenses on meals, hotel accommodation, local transportation and sightseeing activities.

IX. Additional Information:

- The participating teams/delegations are responsible for their own travel expenses to and from Lucknow, Uttar Pradesh, India and that include their Visa Application and other related expenses.
- Leaders and Deputy Leaders are responsible for the conduct/behavior of their contestants.
- The respective participants/delegates are responsible for acquiring their accident insurance during the official period of the competition. All ITMO 2019 participants are advised to arrange medical insurance for themselves in their own countries.

X. Contest Regulations:

1. The ITMO 2019 will be conducted in three parts:
 - a. Individual Competition
 - b. Team Competition and Group Contest
 - c. Math Games Competition

2. Each participating team is expected to submit a maximum of five proposed problems with solutions, to be received by us not later than 15th June 2019. The proposed problems and solutions should be encoded in English language.
3. The proposals should, as far as possible, cover various fields of mathematics prescribed for the Key Stage 3 and Key Stage 2 and must be different in degrees of difficulty.
4. Contestants are not allowed to bring with them books, calculators or computers during the contest.
5. The solution to the problems will be assessed and evaluated by the Jury Committee, which is appointed by the ITMO 2019.

6. KEYSTAGE II (Individual Contest) :

- You are allowed 90 minutes for this paper, consisting of 15 questions to which only numerical answers are required.
- Each question is worth 10 points. No partial credits are given. There are no penalties for incorrect answers, but you must not give more than the number of answers being asked for. For questions asking for several answers, full credit will only be given if all correct answers are found.
- Diagrams shown may not be drawn to scale.

7. KEYSTAGE III (Individual Contest) :

- You are allowed 120 minutes for this paper, consisting of 12 questions in Section A to which only numerical answers are required, and 3 questions in Section B to which full solutions are required.
- Each question in Section A is worth 5 points. No partial credits are given. There are no penalties for incorrect answers, but you must not give more than the number of answers being asked for. For questions asking for several answers, full credit will only be given if all correct answers are found. Each question in Section B is worth 20 points. Partial credits may be awarded.
- Diagrams shown may not be drawn to scale.

8. KEYSTAGE II (Team Contest) :

- You are allowed 60 minutes for this paper, consisting of 10 questions printed on separate sheets. For questions 1, 3, 5, 7 and 9, only numerical answers are required. For questions 2, 4, 6, 8 and 10, full solutions are required.
- Each question is worth 40 points. For odd-numbered questions, no partial credits are given. There are no penalties for incorrect answers, but you must not give more than the number of answers being asked for. For questions asking for several answers, full credit will only be given if all correct answers are found. For even-numbered questions, partial credits may be awarded.

- Diagrams shown may not be drawn to scale.

9. KEYSTAGE III (Team Contest) :

- You are allowed 60 minutes for this paper, consisting of 10 questions printed on separate sheets. For questions 1, 3, 5, 7 and 9, only numerical answers are required. For questions 2, 4, 6, 8 and 10, full solutions are required.
- Each question is worth 40 points. For odd-numbered questions, no partial credits are given. There are no penalties for incorrect answers, but you must not give more than the number of answers being asked for. For questions asking for several answers, full credit will only be given if all correct answers are found. For even-numbered questions, partial credits may be awarded.
- Diagrams shown may not be drawn to scale.

X. Medals and Trophies:

The winners are awarded trophies, gold, silver, bronze medals and merit awards. Each participant will also receive a certificate of participation.

1. Individual Prizes

Two thirds of the total participants will be awarded medals based on their performances in the Individual Contest. The number of gold, silver, bronze medals and merit awards is in the ratio 1:2:3:4.

2. Group Prizes

The scores of the top three members of each team in the individual competition will be summed up to identify the winners in the group prizes. If the scores of two or more teams are the same, the winner will be based on the group whose member got the highest score in the individual competition.

3. Team Prizes

First, second and the third prize trophies are awarded to the top three teams in the different groups. In case of a tie, the team that solves and answers correctly the difficult question/s shall receive the trophy.

4. Math Puzzle Game Contest Prize.

The puzzle contest is individual. The top four (4) contestants will be awarded with a trophy/certificate.

Tentative Schedule

Date	Team Leaders	Deputy Team Leaders/Parents/Participants
13 October (Sunday) Day 1	Arrival	Arrival
	Opening Ceremony (PM)	
	Team Leaders Meeting	Rest
14 October (Monday) Day 3	Sightseeing	Student: Individual Contest Proper Deputy Leaders/Companions Sightseeing (AM)
		Students: Team Contest Proper Deputy Leaders/Companions Shopping (PM)
15 October (Tuesday) Day 4	FREE TIME (AM)	Sightseeing (AM)
	Moderation (PM)	Shopping (PM)
	Gala Night/Cultural Presentation/Food Fest	
16 October (Wednesday) Day 5	FREE TIME	Puzzle Challenge
	Closing and Awarding Ceremonies	

17 October
(Thursday)
Day 6

Home Sweet Home / Departure

Important 2019 ITMO Dates:

- a. Date and Venue:
 - **13th to 17th October, 2019**, City Montessori School, Lucknow Uttar Pradesh, India
- b. Date of Confirmation of Participation:
 - Not later than **30th May, 2019**
- c. Submission of Application Form:
 - Not later than **01st June, 2019**
- d. Submission of Proposed Problems:
 - Not later than **15th June, 2019**
- e. Submission of Delegates List and Flight details:
 - Not later than **15th September , 2019**

Syllabus

SYLLABUS: KEY STAGE II

Numbers and algebra	Geometry and Measurement	Data analysis and Probability	Mathematical Skills and Processes
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<p>Integers, rational numbers and their representations (fraction, decimal, and percentage) prime factorization, greatest common divisor, least common multiples, number ordering, ratio and proportion, Patterns, equations</p>	<p>Angle and its measure, area and perimeter, triangle, polygon, parallelogram, trapezoid, circles, cube, parallelepiped nets, symmetry, reflection and rotation, and similarity translation and similarity</p>	<p>Data representation, mean (average), median, mode, probability.</p>	<p>Problem solving, reasoning, Communication of mathematical concepts, Linking and connecting different areas within mathematics as well as to areas in other fields of knowledge. Creativity and initiative. Logical thinking.</p>
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Syllabus

SYLLABUS: KEY STAGE III

Number Theory and Algebra	Geometry	Probability and Data Analysis	Mathematical Skills and Processes
<p>divisibility, primes and prime factorization, greatest common divisors, quadratic equations, identities, remainder theorem for polynomials, binomial theorem, factoring ; systems of equations, exponents, basic inequalities, such as linear and quadratic inequalities</p>	<p>Pythagoras' Theorem; Areas and volumes; Triangles; quadrilaterals, Polygons; parabolas; Similar triangles; Congruence of triangles; Relations between two and three dimensional geometric figures; basic geometric Transformations special values of trigonometric Function; basic Trigonometric identities; Pythagorean identities; Law of sine and</p>	<p>Elementary theory of real numbers, excluding limit and the calculus; Probability, sequences; geometric and arithmetic series; Percent and proportions.</p>	<p>Problems solving, reasoning, Communication of mathematical concepts, Linking and connection different areas within mathematics as well as to areas in other fields of Knowledge. Creativity and initiative Logical thinking</p>

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ABOUT CITY MONTESSORI SCHOOL

Dr. Jagdish Gandhi and Dr. Bharti Gandhi, the eminent and prolific educationists, social reformers and cultural anthropologists are persistently adding a new dimension to the ever expanding periphery of City Montessori School, the world's largest school with over 56,000 students on its rolls and 45,800 staff across 18 branches of City Montessori School situated in the prime locations of the capital city, Lucknow in Uttar Pradesh, India.

City Montessori School was founded in 1959 with five children on a borrowed capital of Rs 300. CMS today is an ICSE and ISC affiliated school whose students are continuously achieving the highest exam results in India.

Dr. Jagdish Gandhi and Dr. Bharti started CMS with the aim of bringing change in the world and spreading world peace, empowering the weak and poor, developing skills and ethics amongst students.

Blessed is the capital city of U.P, Lucknow to possess the world's largest school. The 27 international events organized every month by CMS have elevated the status of not only Lucknow but also the great country, India. Every CMS event starts with a prayer for peace in the world. Students are groomed here to become a confident, articulate, good and smart citizen of the world ready to step into the Global society with dignity, honour and integrity. The motto of 'Jai Jagat'-Hail the World, the everyday greeting that is used to wish one another in the premises of CMS promotes the ideals of World Unity and World Peace across the globe. The different International events cater to different subjects like Geography, History, English Language, Computer Science, Science and Technology, Mathematics and Sports.

We, at CMS dream of a New World Order that reflects the aspirations of the youth, a world order which is economically stable, where one can work religiously for the advancement of humanity believing in mankind as one human family. We at CMS follow the philosophy of *Vasudhaiva Kutumbkam*.

This year CMS,Gomti Nagar Campus I is given the responsibility of hosting the 2019 ITMO.

It is a matter of great pride to acknowledge that CMS, Gomti Nagar Campus I has been awarded by the *Education World Magazine* as the **Best school in Uttar Pradesh and No.1 Co-education Day school** in Lucknow. We keep on receiving the appreciative responses from most other schools of our country. Success is not an accident, it is hard work, perseverance, learning, studying, sacrifice and this was recognized when C.M.S. Gomti Nagar Campus I received the **Elite India School Rankings Award 2018-2019**. We were honoured in Mumbai by the *Fortune India* for our campus making it to the **Top 50 schools of India 2017 -18** and yet again in **2018-19** the same award was received by Gomti Nagar Campus I.

It is blissful to be benchmarked as one of the Future 50 schools shaping success for preparing students to succeed in the 21st century. The distinguished contribution of CMS Gomti Nagar I was amply recognized when the popular educational magazine '*Brainfeed*' felicitated us with the **Coveted school excellence award 2018** for its academic reputation and admirable vision.

To provide the students global exposure to become successful world leaders in life and in their chosen fields and to unite the world, CMS empowers each child with knowledge and wisdom by regularly organizing **27 international educational events in which thousands of students participate from around the world**. To know more about the school and information about the various international events visit <http://www.cmseducation.org/>

We support as many participants as possible with limited resources. For this reason we ask you to confirm your registration to participate in the ITMO, 2019 not later than 30th May, 2019.

Accordingly, we would always seek and appreciate your benign cooperation, esteemed patronage and an immense thoughtfulness.