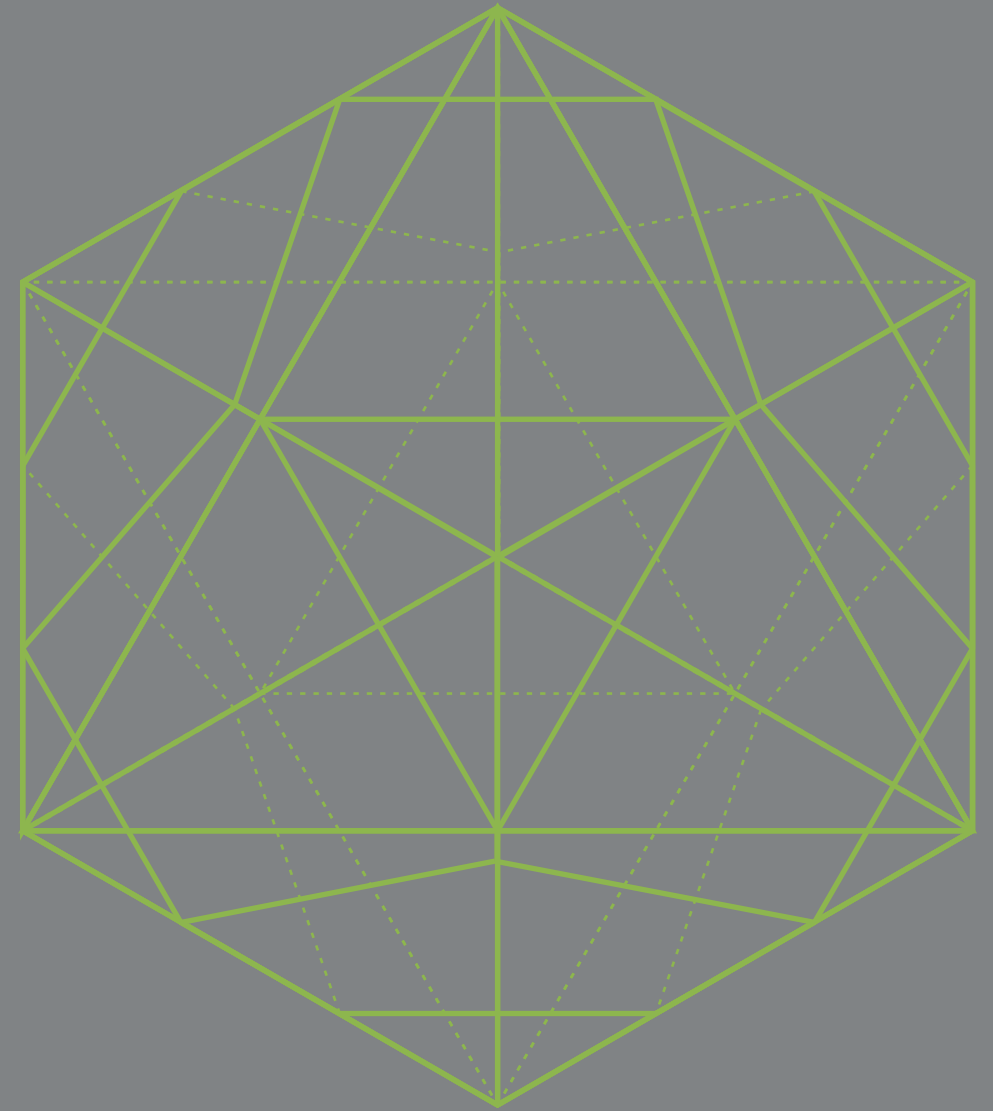


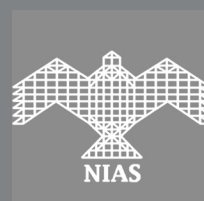
✉ [mathcircle@icts.res.in](mailto:mathcircle@icts.res.in)

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# ICTS – NIAS MATHS CIRCLE

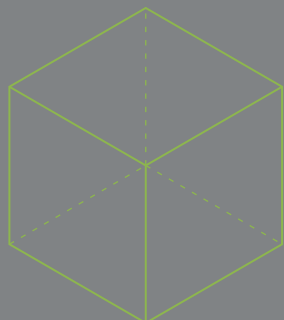
*An initiative to encourage mathematically inclined children towards  
mathematical discovery and research*



International Centre for Theoretical Sciences (ICTS-TIFR) and  
National Institute for Advanced Studies (NIAS),



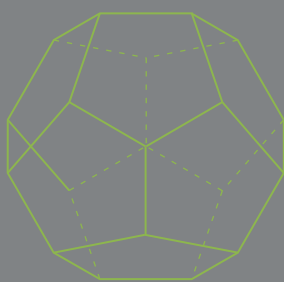
Tetrahedron



Cube



Octahedron



Dodecahedron



Icosahedron

## ICTS–NIAS MATHS CIRCLE

In the Indian school curriculum, Mathematics is often taught as a dry subject that involves the rote-memorization of some formulas or proofs. As a result, some of the brightest and most mathematically inclined children—instead of pursuing research in mathematics and mathematical sciences—tend to leave the subject.

The Maths circle is a new initiative in Bangalore, launched by the International Centre for Theoretical Sciences (ICTS–TIFR) and the National Institute for Advanced Studies (NIAS), with a view to identifying mathematically inclined students at an early stage and honing their aptitude and mathematical skills. These circles are not designed to train students for a specific exam. Rather, the idea is to expose students to the joy of mathematics, and its prevalence in the world around us by emphasizing the empirical roots and far-reaching empirical consequences of beautiful mathematical ideas.

The Maths circle will involve a group of carefully selected students, who will meet once in two weeks on weekends for a few hours to discuss carefully chosen mathematical problems. The problems and course-material will be curated by active researchers in Mathematics and the sessions will be led by PhD students and postdoctoral researchers with an aptitude for communication and pedagogy.

Some of the topics that we plan to cover include elementary combinatorics, the principles of symmetry, geometry, and elementary number theory. We do not expect students to have had prior exposure to these topics, and the problems will be designed to introduce

these topics through real world examples that will allow the students to make friends with these ideas.

The circle will not be competitive. Students will be encouraged to work collaboratively on the problems that are given in the sessions. The problems are designed so that there is more than “one right way” of solving them; so a student might often come up with an innovative and new way of solving the problem that even the instructor has not thought of. Moreover, the consideration of a problem will lead to an open-ended exploration of other ideas. The expectation is that mathematically inclined students will enjoy these hours of discovery and exploration.

We initially aim to have a mixed age-group of students, ranging from class 7 to class 9. These students will be divided into two groups of about twenty five students each. However, the idea of the Maths circles is to eventually expand beyond these age groups: Maths circles have historically also been organized for students as young as five years old, and for more senior students who are completing their school education. We would like to encourage the formation of autonomous Maths circles in other parts of the city. These circles would be free to use materials and techniques from our Maths circle, and also free to expand the age-groups and choice of topics.

The idea of Maths circles historically originated in the Soviet Union and the erstwhile socialist countries. In a short period of time, these countries produced a set of remarkable mathematicians and a number of breakthroughs in Mathematics. The Maths circles are believed to have contributed in identifying and nurturing mathematically inclined students, who went on to be famous Mathematicians. In the past three decades, this idea has been duplicated in the United States, where there are hundreds of Maths circles that have also succeeded in nurturing a number of young mathematicians. We hope to have a similar impact in India.

**Twice a month at NIAS 10 am – 1 pm**

**Problems and concepts will be broadly based on 8<sup>th</sup>–9<sup>th</sup> grades' curriculum**

**3-4 facilitators per session**

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