



1977年创办



2025

美国

Math League

决赛和数学夏

令营介绍



一项具有全球影响力的中
小学数学思维探索活动！



www.mathleague.world

美国 Math League 历史



美国 Math League 思维探索活动 是美国及北美地区具有卓越影响力的中小学数学思维探索活动，也是一项具有全球影响力的中小学数学思维探索活动，从1977年至今每年连续举办。



创始人介绍

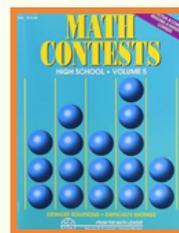
美国 Math League 思维探索活动创始人Mr. Steven R. Conrad和Mr. Daniel Flegler是美国著名的数学教育家，1977年Mr. Daniel Flegler获得普林斯顿大学颁发的“卓越中学教育奖”，其后在1985年两人更是荣获由里根总统颁发的“杰出数学和科学教育总统奖”，the Presidential Awards for Excellence in Mathematics and Science Teaching (PAEMST)，全美国数学和科学教育最高奖。The Presidential Awards for Excellence in Mathematics and Science Teaching (PAEMST) are the nation's highest honors for teachers of mathematics and science (including computer science). Awardees serve as models for their colleagues, inspiration to their communities, and leaders in the improvement of mathematics and science education. Daniel Flegler is the winner from New Jersey State, and Steven R. Conrad is the winner from New York State.



Mr. Steven R. Conrad



Mr. Daniel Flegler



同时Mr. Steven R. Conrad和Mr. Daniel Flegler也担任了很多数学杂志的主编和审阅人。他们是美国十五个州和地区的数学竞赛组委会主任委员或委员。他们还曾经担任了六年的美国SAT组委会会员(SAT是美国大学的入学考试)。另外他们共同出版了18本书。



2025年美国 Math League 决赛和数学夏令营概述

- 2025年美国 Math League 决赛和数学夏令营由美国 Math League 组委会和普林斯顿大学数学系 (Princeton University Mathematics Department)、哥伦比亚大学数学系 (Columbia University Mathematics Department)、威廉姆斯学院 (Williams College) 联合举办，地点在美国新泽西州。
- 参加2025年美国 Math League 决赛和数学夏令营的学生包括来自美国、加拿大、中国等世界各地的优异学生。
- 内容包括决赛及数学学习。



2025年决赛和数学夏令营日期

4-5年级组：2025年7月12日(check-in date)到7月19日(check-out date)

6-9年级组：2025年7月20日(check-in date)到7月28日(check-out date)



2025年美国 Math League 决赛和数学夏令营课程表



4-5年级组课程安排(暂定)

Math League 2025 Schedule (Grades 4-5, tentative)								
Time	Saturday 12-Jul	Sunday 13-Jul	Monday 14-Jul	Tuesday 15-Jul	Wednesday 16-Jul	Thursday 17-Jul	Friday 18-Jul	Saturday 19-Jul
8:00 AM								
8:30 AM		Breakfast	Breakfast	Breakfast	Breakfast	Breakfast		Breakfast
9:00 AM		Math Lecture & Math Activities (Professor: TBD, Title: TBD)	Math Lecture & Math Activities (Professor: TBD, Title: TBD)	Math Tournament (Speed Round, location: TBD)	Math Lecture & Math Activities (Professor: TBD, Title: TBD)	Math Lecture & Math Activities (Professor: TBD, Title: TBD)	Math Lecture & Math Activities (Professor: TBD, Title: TBD)	Math Lecture & Math Activities (Professor: TBD, Title: TBD)
10:00 AM								Departure Day (International students)
10:30 AM		Math Lecture & Math Activities (Professor: TBD, Title: TBD)	Math Tournament (Individual Round, Part I, location: TBD)	Math Lecture & Math Activities (Professor: TBD, Title: TBD)	Math Lecture & Math Activities (Professor: TBD, Title: TBD)	Math Lecture & Math Activities (Professor: TBD, Title: TBD)	Math Lecture & Math Activities (Professor: TBD, Title: TBD)	
11:00 AM								
11:30 AM						Departure (for North American Students)		
12:00 PM		Lunch	Lunch	Lunch	Lunch	Lunch	Lunch	
12:30 PM								
1:00 PM								
1:30 PM								
2:00 PM		Math Tournament (Team Round, location: TBD)	Math Lecture & Math Activities (Professor: TBD, Title: TBD)	Math Lecture & Math Activities (Professor: TBD, Title: TBD)	Math Lecture & Math Activities (Professor: TBD, Title: TBD)		Math Lecture & Math Activities (Professor: TBD, Title: TBD)	
2:30 PM		Break	Break	Break	Break	Field Trip (Princeton University and Vicinity)	Break	
3:00 PM		Math Lecture & Math Activities (Professor: TBD, Title: TBD)	Math Tournament (Individual Round, Part II, location: TBD)	Math Tournament (Relay Round, location: TBD)	Math Lecture & Math Activities (Professor: TBD, Title: TBD)			Tournament Summary ()
3:30 PM	Arrival at Campus (All students)							
4:00 PM	Opening dinner	Recreational activities ()			Recreational activities ()			
4:30 PM		Dinner	Dinner	Dinner	Dinner	Dinner	Dinner	
5:00 PM								
5:30 PM								
6:00 PM								
6:30 PM								
7:00 PM		Talent Show, Part 1 (location: TBD)	Talent Show, Part 2 (location: TBD)	movie night	Math League Award Ceremony (location: Cromwell Lounge)	Reading, Journal Writing, Quiet time	Reading, Journal Writing, Quiet time	
7:30 PM								
8:00 PM								
8:30 PM								
9:00 PM								
9:30 PM								
10:00 PM	Lights out	Lights out	Lights out	Lights out	Lights out	Lights out	Lights out	

TBD: To be decided

6-9年级组课程安排(暂定)

Math League 2025 Schedule (Grades 6-9, tentative)								
Time	Sunday 20-Jul	Monday 21-Jul	Tuesday 22-Jul	Wednesday 23-Jul	Thursday 24-Jul	Friday 25-Jul	Saturday 26-Jul	Sunday 27-Jul
8:00 AM								
8:30 AM			Breakfast	Breakfast	Breakfast	Breakfast	Breakfast	Breakfast
9:00 AM		Math Lecture & Math Activities (Professor: TBD, Title: TBD)	Math Lecture & Math Activities (Professor: TBD, Title: TBD)	Math Lecture & Math Activities (Professor: TBD, Title: TBD)	Math Tournament (Speed Round, location: TBD)	Math Lecture & Math Activities (Professor: TBD, Title: TBD)	Math Lecture & Math Activities (Professor: TBD, Title: TBD)	Math Lecture & Math Activities (Professor: TBD, Title: TBD)
9:30 AM								Departure Day (International students)
10:00 AM		Math Lecture & Math Activities (Professor: TBD, Title: TBD)	Math Lecture & Math Activities (Professor: TBD, Title: TBD)	Math Tournament (Individual Round, Part I, location: TBD)	Math Lecture & Math Activities (Professor: TBD, Title: TBD)	Math Lecture & Math Activities (Professor: TBD, Title: TBD)	Math Lecture & Math Activities (Professor: TBD, Title: TBD)	
10:30 AM								
11:00 AM								
11:30 AM						Departure (for North American Students)		
12:00 PM		Lunch	Lunch	Lunch	Lunch	Lunch	Lunch	
12:30 PM								
1:00 PM								
1:30 PM		Math Lecture & Math Activities (Professor: TBD, Title: TBD)	Math Tournament (Team Round, location: TBD)	Math Lecture & Math Activities (Professor: TBD, Title: TBD)	Math Lecture & Math Activities (Professor: TBD, Title: TBD)	Math Lecture & Math Activities (Professor: TBD, Title: TBD)	Math Lecture & Math Activities (Professor: TBD, Title: TBD)	
2:00 PM		Break	Break	Break	Break	Break	Field Trip (Princeton University and Vicinity)	
2:30 PM	Arrival at Campus (North America students)	Math Lecture & Math Activities (Professor: TBD, Title: TBD)	Math Tournament (Individual Round, Part II, location: TBD)	Math Tournament (Relay Round, location: TBD)	Math Lecture & Math Activities (Professor: TBD, Title: TBD)			Tournament Summary ()
3:00 PM	Arrival at Campus (International students)							
3:30 PM	Opening dinner	Recreational activities ()		Recreational activities ()				
4:00 PM		Dinner	Dinner	Dinner	Dinner	Dinner	Dinner	
4:30 PM								
5:00 PM								
5:30 PM								
6:00 PM								
6:30 PM								
7:00 PM		Orientation	Talent Show, Part 1 (location: TBD)	Talent Show, Part 2 (location: TBD)	Movie night	Math League Award Ceremony (location: TBD)	Reading, Journal Writing, Quiet time	Reading, Journal Writing, Quiet time
7:30 PM								
8:00 PM								
8:30 PM								
9:00 PM								
9:30 PM								
10:00 PM	Lights out	Lights out	Lights out	Lights out	Lights out	Lights out	Lights out	

TBD: To be decided



2025年美国 Math League 决赛赛制



2025年美国 Math League 决赛包括个人决赛和团体决赛。其中个人决赛包括 Individual Round 和 Speed Round，团体决赛包括 Relay Round 和 Team Round。



个人决赛

Individual Round:

参赛学生独立完成10-15道题目，每道题限时7~10分钟不等(题目相对比较难)。

Speed Round:

在45分钟内完成60道填空题，考察答题速度和准确度。



团体决赛

Team Round:

团队成员在1-2小时内共同完成10-15道题。

Relay Round:

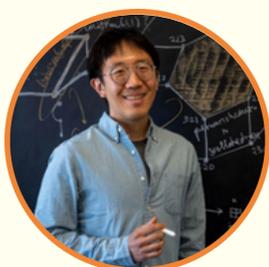
以接力赛的形式，一共4道接力题，每道接力题包含4个独立的问题。每4个团队成员排成一列，依次解题并传递答案，最终以第四人提交的答案判定得分。

美国 Math League 决赛和数学夏令营授课教授



2025年美国 Math League 决赛和数学夏令营期间，由普林斯顿大学数学系、哥伦比亚大学数学系、威廉姆斯学院、Swarthmore College, Rutgers University 等著名大学的教授给学生授课，指导学生学习数学。

顶尖教授团队(部分)



June Huh
Princeton University



Matt Weinberg
Princeton University



Jacob Shapiro
Princeton University



Pravesh Kothari
Princeton University



Mark Saul
Mathematical
Association of America



Doron Zeilberger
Rutgers University



Neil Sloane
AT&T Bell Labs



Arthur Benjamin
Harvey Mudd College



Steven Miller
Williams College



Glen Whitney
National Museum of
Math



Pat Devlin
Swarthmore College



Michael Thaddeus
Columbia University

决赛和数学夏令营 往届部分授课内容



1. From the Quadratic Formula to Differentiation (从二次公式到微分)
2. Mathematics in History, Applications, and Enjoyment (数学的历史、应用和乐趣)
3. Mathematics and Music (数学与音乐)
4. The Wonderful World of Permutations (奇妙的排列世界)
5. Using Randomness in Proofs (在证明中使用随机性)
6. Mathematics and Games (数学与游戏)
7. Stable Machine (稳定的机器)
8. Famous Sequence (著名序列)
9. Tensegrity Polyhedra (张力多面体)
10. Grundy's Game (格兰迪游戏)
11. Apollonian Circle Packings (阿波罗尼安圆填充)
12. Diving into Dimensions (维度探索)
13. How to Use Math to Build a Safe World? (如何用数学构建一个安全的世界?)
14. What's Your Favorite Number? (你最喜欢的数字是什么?)
15. The Art of Problem Solving (解题的艺术)
16. Unlocking Math Magic: Exploring Numbers with AR & VR
(揭开数学魔法：用AR和VR探索数字)
17. Knot Theory (结理论)
18. Checking Divisibility Using Finite Automata (使用有限自动机检查可除性)
19. NIM and JIM
20. Introduction to Mathematical Physics (数学物理导论)
21. Modular Origami (模块折纸)

学生参加美国 Math League 决赛和数学夏令营可以获得什么？



身临其境学习数学

- 数学思维与技能
- 数学与艺术
- 数学在生活中的应用

国际交流 学术提升

1. 参加世界著名数学竞赛的决赛。获奖的学生可以获得获奖证书。所有学生可以获得结业证书。积极参与和奉献的学生可以获得志愿者证书。
2. 在著名数学教授的指导下学习数学，激发学习数学和科学的兴趣、开拓视野。
3. 和来自世界各地的优秀学生交流、学习，成为朋友。
4. 学生在决赛和夏令营结束前会在Counselor(辅导员)的帮助下撰写参加决赛和夏令营的小结，小结会发给家长。
5. 有机会获得美国教授写的推荐信，和美国教授建立长期的联系，在美国教授的指导下学习数学和从事数学研究，并有机会和美国教授合作在数学学术期刊上发表数学论文。
6. 美国 Math League 决赛和夏令营举办十多年来，有很多参加过决赛和夏令营的学生被世界著名学府录取 (包括哈佛大学、斯坦福大学、普林斯顿大学、哥伦比亚大学、芝加哥大学、加州大学伯克利校区、牛津大学、剑桥大学等)。



美国 Math League 决赛和数学夏令营证书



个人决赛证书



团体决赛证书



结业证书



志愿者证书



美国知名教授指导学生科研



有机会获得美国教授写的推荐信，和美国教授建立长期的联系，在美国教授的指导下学习数学和从事数学研究，并有机会和美国教授合作在数学学术期刊上发表数学论文。以下是参加美国 Math League 决赛和夏令营的两名学生(一名小学生和一名初中生)在 Steven Miller 教授(Williams College)的指导下撰写的 数学论文 (已在著名数学学术期刊上发表)。

GEOMETRIC PROOFS OF THE IRRATIONALITY OF SQUARE-ROOTS FOR SELECT INTEGERS

ZONGYUN CHEN, STEVEN J. MILLER, CHENGHAN WU

1. INTRODUCTION

The positive integers $1, 2, 3, \dots$ are not surprisingly one of the most important sequences in mathematics, and typically the first encountered. Quickly one meets interesting sub-sequences, such as the primes $(2, 3, 5, 7, 11, \dots)$, the perfect squares $(1, 4, 9, 16, 25, \dots)$ and the Fibonacci numbers $(1, 2, 3, 5, 8, \dots)$ to name just a few. These are well studied and arise in numerous places; see the On-line Encyclopedia of Integer Sequences [OEIS] for details and properties of these and others.

Almost all integers have irrational square-roots, with the percent of $n \leq x$ with $\sqrt{n} \notin \mathbb{Q}$ approximately $100 \cdot x^{-1/2}\%$. The standard proof uses the property that if a prime p divides a product xy then $p|x$ or $p|y$ or both (see for example [MS] for a proof) and the Fundamental Theorem of Arithmetic (every integer can be written uniquely as a product of primes in increasing order; see [HW]).

Assume a non-square $n > 1$ has a rational square-root; thus we can write $\sqrt{n} = a/b \in \mathbb{Q}$ with a, b relatively prime integers and without loss of generality it suffices to consider n that are square-free, as if $n = m_1 m_2^2$ then $\sqrt{n} = \sqrt{m_1} \cdot m_2$. Then $nb^2 = a^2$. As $n > 1$ is square-free, there is a prime p that divides n . Thus $p|a^2$ so $p|a$ and we can write a as αp . Substituting yields $nb^2 = \alpha^2 p^2$; as n is square-free and a multiple of p , we must have n/p is an integer relatively prime to p and thus $p|b^2$. A similar argument now shows $b = \beta p$, contradicting a and b are relatively prime and therefore \sqrt{n} is irrational.

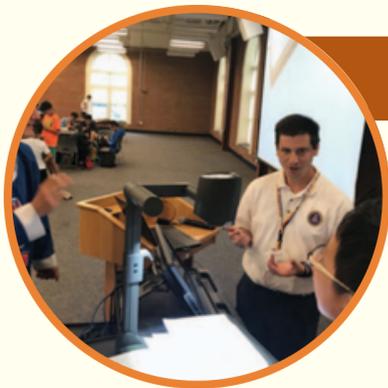
There's a lot of interesting history on this proof; if we don't use the property that if a prime divides a product then it divides at least one factor, we can mimic the above argument, but only by essentially reproving the result case by case. For example, if $n = 2$ then we would have $2b^2 = a^2$. If $a = 2\alpha + 1$ is odd then $a^2 = 4\alpha^2 + 4\alpha + 1$ is odd, and thus cannot be a multiple of 2, and thus $a = 2\alpha$. Similarly if $n = 3$ we would have $3b^2 = a^2$ and 3 must divide the right hand side as it divides the left. We can write $a = 3\alpha + r$ with $r \in \{0, 1, 2\}$ and note

$$a^2 = 9\alpha^2 + 6\alpha r + r^2 = 3(3\alpha^2 + 2\alpha r) + r^2,$$





什么样的学生适合参加美国 Math League 决赛和数学夏令营?



热爱数学

- 热爱数学和科学
- 愿意挑战自我



开拓视野

- 希望拓展国际视野
- 将来成为国际化人才



国际留学

- 计划将来去美国(和其他国家)留学





美国 Math League 决赛和数学夏令营赛前学习和培 训包括哪些内容？

赛前培训与学习

- 美国“天才班”课程及练习，培养学生 Creative thinking, critical thinking, and problem solving skills
- 往届决赛试题解析，学习数学的英文思维，掌握数学英文词汇，深刻理解数学问题。
- 决赛和数学夏令营期间教授授课内容预习，以便学生在决赛和数学夏令营学习时更好地理解教授的授课内容。
- 美国其他顶尖数学竞赛试题解析，开拓学生的视野。
- 数学与创新
- 中美教育比较
- 8周的培训和学习资料包含关键点讲解、学生学习资料、评测题等。每周的评测题在下一周公布答案。





美国 Math League 决赛和数学夏令营安全与保障

全程监管，统一安排

学生在营地期间所有学习和活动均由学校老师全程监管和统一安排，学生不能自由行动，每 12 名学生有 2 名学校老师 24 小时监管。



医疗保障服务

感冒、发烧、肚子痛等小病，学校医院可以立即治疗；其他情况，学校老师会送学生前往附近的医院就诊。



大学宿舍，标准用餐

标准大学学生宿舍，每个单元有三层楼，每层楼有 4 个单间，每层楼共用一个浴室和卫生间。
用餐是标准美国学生用餐(自助餐)。

接机与送机服务

如有需要，组委会提供接送机服务。组委会老师去机场接学生或者送学生去机场，帮助学生值机、托运行李等。



The New York Times

NUMBERPLAY

Breaking the Grip of the Gaokao, China's SAT

By GARY ANTONICK August 31, 2015 12:00 pm



Gary Antonick (center front) with the China Math League team outside Wallenberg Hall at Stanford University on Aug. 19, 2015. Gary Antonick

The notorious *Gaokao*, (高考, or “High Test”) is China’s SAT on steroids, with a score on the nine-hour test being the sole criterion for admission to Chinese universities. Preparing for the test is a years-long obsession for both students and parents. (In case you missed it: Brook Larmer’s *Inside a Chinese Test-Prep Factory*.) And for many, the unfortunate consequence is that the lengthy preparation destroys, rather than enhances, academic ability. Student enthusiasm and curiosity are crushed.

Although many in China are aware of the Gaokao’s impact, the test has a 1,300-year history and will not be easily killed. Instead, perhaps the best way to break the Gaokao’s life-draining grasp is indirectly, through clubs and activities that rejuvenate kids’ sense of curiosity and fun. And two weeks ago I discovered one such extra-curricular activity that’s becoming popular among Chinese math-lovers: The Math League, an organization based in New Jersey committed to having kids worldwide enjoy math and discussions about problem-solving.