



Math Contests
at Illinois

Overview

Sample
Contest
Problems

Training
Sessions

Local Math
Contests

National Math
Contests
(Putnam,
Virginia Tech)
Putnam

MCM (Math
Modeling
Contest)

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Resources

Math Contests at Illinois

UI Math Contest Open House
September 10, 2019

www.math.illinois.edu/contests.html



Math Contest Coaching Team

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Resources

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Mailing List and Math Contest Survey

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- **Putnam Mailing List:** To receive announcements about upcoming activities, send an email with your NetID and Subject “Putnam Mailing List” to

ajh@illinois.edu

- **Math Contest Survey:** If you have not done so already, fill out our online survey:

<http://go.illinois.edu/mathcontestsurvey>



Outline

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UI Math Contest Program: Overview

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- **Three national/international contests each year:** Putnam, Virginia Tech Math Contest, MCM/ICM.
- **Three local math contests each year:** UI Freshman Contest, UI Mock Putnam Exam, UI Undergraduate Math Contest.
- **Extensive program of contest training:** Training sessions offered throughout the fall semester at beginner and intermediate/advanced levels.
- **UI Putnam Mailing List:** Email ajh@illinois.edu
- **UI Math Contests Webpage:** Google “Math Contests UIUC”

www.math.illinois.edu/contests.html



Math Contest Activities: Fall Events

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- **UI Freshman Math Contest**
(Saturday, Oct. 12, 2019, 10 am - 12 pm, 245 Altgeld)
- **UI Mock Putnam Exam**
(Saturday, Oct. 12, 2019, 1 pm - 4 pm, 245 Altgeld)
- **Virginia Tech Math Contest**
(Saturday, Oct. 26, 2019, 9 am - 11:30 am, 245 Altgeld)
- **Putnam Exam**
(Saturday, Dec. 7, 2019, 9 am - 5 pm, 245 Altgeld)
- **Training sessions**
(Tuesdays, 5:30 pm - 8 pm, 443 Altgeld)
First session: Tuesday, September 17



Math Contest Activities: Spring Events

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- **Mathematical/Interdisciplinary Contest in Modeling (MCM/ICM) (added in 2013)**
(Feb. 13–17, 2020)
- **UI Undergraduate Math Contest (held since the 1970s)**
(Saturday, Feb. 22, 2020)



Sample Contest Problems

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UI Freshman Math Contest 2011

Find the 2011th digit in the number $0.12345678910111213\dots$, obtained by writing the natural numbers next to each other.

UI Freshman Math Contest 2012

Determine, with proof, whether there exists a power of 2 whose decimal representation ends in the digits 2012.

Putnam 2012

Let d_1, d_2, \dots, d_{12} be real numbers in the open interval $(1, 12)$. Show that there exist distinct indices i, j, k such that d_i, d_j, d_k are the side lengths of an acute triangle.

For solutions and more sample problems, see the Math Contests Website, www.math.illinois.edu/contests.html.



Training Sessions

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- **Schedule:** Tuesdays, 5:30 - 8:00 pm, 443 Altgeld, with a pizza break at the halfway point. You can attend the whole period or only the first or second half.
- **Levels:** In each session, we will have problem sets at two levels:
 - **Beginner level:** For those new to math contests—no experience or specific background needed.
 - **Intermediate/advanced level:** For those with some contest experience (e.g., from high school)
- **Sample topics:** Binomial coefficients, combinatorics, congruences, inequalities, proofs by induction.
- **Format:** The sessions are informal, and largely independent of each other. **No registration required—just show up!**
- **Training session materials:** posted at <http://www.math.illinois.edu/contests.html>



The UI Fall Math Contests: Saturday, Oct. 12 10 am – 12 pm and 1 pm – 4 pm, 245 Altgeld

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- **10 am – 12 pm: Freshman Math Contest**
 - Entry-level math contest.
 - Restricted to UIUC Freshmen and local high school students.
 - Up to \$300 in prize money
 - No prerequisites beyond high school math.
- **12 pm – 1 pm: Lunch/Pizza**
- **1 pm – 4 pm: UI Mock Putnam Exam**
 - Similar to Putnam contest, but a bit easier, and shorter.
 - Open to UIUC Undergraduates and local high school students.
- **PRIZE MONEY:** Up to \$300 in for each contest.
- **Registration opens in late September.**



National Math Contests

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- **Putnam Exam: Saturday, Dec. 7, 2019.**
 - Most prestigious college-level math contest.
 - 12 problems, to be solved in 6 hours.
 - Around 5000 participants each year nationwide, with 20-30 from UI.
 - **Registration opens in November.**
- **Virginia Tech Math Contest, Saturday, Oct. 26, 2019.**
 - A Putnam-style contest for undergraduates
 - Modeled after Putnam, but easier and shorter.
 - 7 problems, to be solved in 2.5 hours.
 - Around 700 participants each year nationwide, with 20-30 from UI.
 - **Registration opens in mid October.**



Top three teams on the Putnam

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- 2018: Harvard, MIT, UCLA
UIUC Team Rank: 32
- 2017: MIT, Harvard, Princeton
UIUC Team Rank: 41
- 2016: Carnegie Mellon, Princeton, Harvard
UIUC Team Rank: 41
- 2015: MIT, Carnegie Mellon, Princeton
UIUC Team Rank: 9th (Honorable Mention)
- 2014: MIT, Harvard, Rensselaer Polytechnic
UIUC Team Rank: 14
- 2013: MIT, Carnegie-Mellon, Stanford
UIUC Team Rank: 41
- 2012: MIT, Carnegie-Mellon, Stanford
UIUC Team Rank: 22



The Putnam at MIT

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Students taking the Putnam at MIT (held in a gymnasium).



MCM (Math Modeling Contest)

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MCM (Math Modeling Contest), Feb. 13–17, 2020

- International team contest in mathematical modeling.
- Over 7000 teams participate each year
- Each team must analyze, model, and solve a real-world problem, and write a paper on it—all this in 96 hours!
- A team consists of three undergraduates from the same university. The team must be registered by a faculty “advisor”. (We can take care of this.)
- Award Designations:
 - **“Outstanding Winner” (1%)**
 - **“Meritorious Participant” (8%)**
 - **“Honorable Mention” (34%)**
 - **“Successful Participant” (55%)**



MCM: UIUC Team Performance 2014–2019

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- **6 Meritorious Participants**
- **14 Honorable Mentions**
- **15 Successful Participants**



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- **Training Sessions:** First session:

Tuesday, Sept. 17, 5:30 pm - 8 pm, 443 Altgeld.

You can come any time during this period. No registration required.



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- **UI Math Contest Website:**

www.math.illinois.edu/contests.html

(Or google “Math Contests”).

- **Books/training materials:** See the “Resources” section at Math Contest Website.
Most are available on course reserve in Math Library.
- **Sample Contest Problems:** The Math Contest website has an extensive collection of past contests, with solutions.
- **Training Session Handouts:** Materials will be posted online at the Math Contest website within a week of the training session.



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THANK YOU!

Hope to see you at the
training sessions and/or
the Fall Math Contests

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