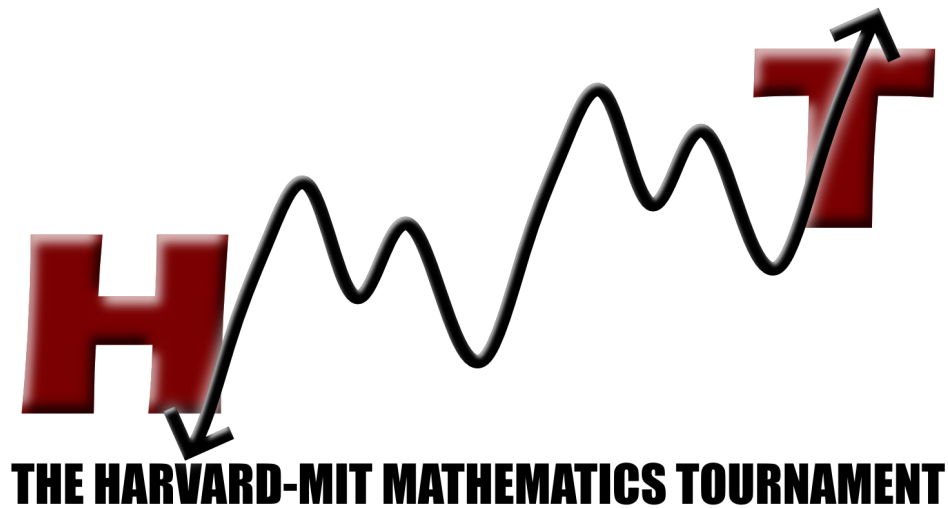


The Fifteenth Annual Harvard-MIT Mathematics Tournament



February 10th-February 11th, 2012



THE HARVARD-MIT MATHEMATICS TOURNAMENT
290 Massachusetts Avenue • Cambridge, MA 02139
<http://hmmt.mit.edu/> • hmmt-request@mit.edu

February 11, 2012

It is our great pleasure to welcome you to the 2012 Harvard-MIT Mathematics Tournament (HMMT). After a highly successful 2011 HMMT, we are excited to see all of you back in Cambridge and ready to compete.

We are deeply committed to running a successful tournament and promoting mathematical curiosity in high school students. By bringing in nearly 900 competitors from across the nation and the world, we believe we can be the incubator to make that happen - but you have to be the ignition! While you are here, please do take some time to introduce yourself to the other competitors and meet people from other teams, especially during the Friday night activities at MIT. When we were competitors, one of our greatest joys was meeting others, and we hope that you will be able to share in that joy as well.

All of our problems are written and compiled by Harvard and MIT undergraduates. We hope that they are not only fascinating and challenging, but also engaging. Our staff of over 30 Harvard and MIT undergraduates, and countless more contributors, have been working tirelessly over the past year to make this competition a reality. In addition to the traditional team round and signature Guts event, this year's individual round will feature three separate tests in Algebra, Geometry, and Combinatorics.

Should you have any questions, comments, or concerns during the tournament, please feel free to ask any of the staff members of the tournament for help - we can be identified by our crimson-colored T-shirts. Should you have any feedback about the tournament, please email us at hmmt-feedback@mit.edu. If you are interested in general updates and mathematical thoughts about HMMT, please follow us on our Twitter @mathtournament and our Facebook at [facebook.com/hmmt.info](https://www.facebook.com/hmmt.info). Announcements will be tweeted throughout the day.

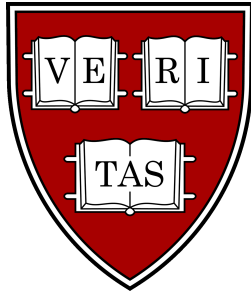
Whether you are new to HMMT or a returning veteran, good luck and enjoy your time here! On behalf of the entire staff, we look forward to welcoming you to the 2012 Harvard-MIT Mathematics Tournament!

Sincerely,

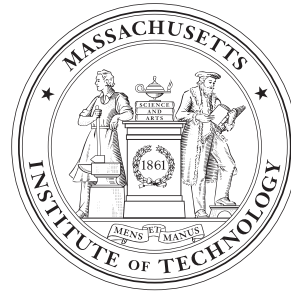
William Chen, Harvard
Mark Velednitsky, MIT
Tournament Directors

Brian Hamrick
Travis Hance
George Xing
Problem Czars

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Problem Writers

Justin Brereton
Casey Fu
Carl Lian
Jonathan Schneider
Jeffrey Wu
Sherry Wu
Joy Zheng

*...and all of our day-of
volunteers!*

#	School	Team	Team Round
1	AAST	Bergen Academies AVPA	Maxwell–Dworkin 323
2		Bergen Academies AEDT	Maxwell–Dworkin 221
3		Bergen Academies ABF	Sever 101
4	Accord Institute - IDEA MATH	Accord A* IDEA MATH Air	Science Center 221
5		Accord A* IDEA MATH Fire	Maxwell–Dworkin 221
6		Accord A* Earth	Emerson 210
7	Acton-Boxborough High School	WeMade USAMO	Maxwell–Dworkin 319
8	Advanced Math and Science Academy	AMSA Charter	Maxwell–Dworkin G125
9	Albany Area Math Circle	Steinmetz	Science Center 309
10	American School of Brasilia - EAB	EAB Bulls	Sever 107
11	Archbishop Molloy High School	Stanford OHS	Sever 213
12	Baton Rouge Magnet High School	Baton Rouge Math Team	Sever 113
13	Beijing STFX	Beijing STFX A1	CGIS Knafel K107
14		Beijing STFX A2	Sever 201
15	Bejing University High School	BUHS 1	Science Center 304
16	Belmont High School	Robert’); DROP TABLE Students;–	Maxwell–Dworkin 119
17	Bishop Brady High School	Bishop Brady High School	Pierce 100F
18	BNL Gifted Math Program	BNL Octachorons	Sever 213
19		BNL Tesseract	Sever 104
20		Canyon Crest Academy SoCalCoolUs	Maxwell–Dworkin 119
21	Choate Rosemary Hall	Choate A	Science Center 309
22		Choate B	Emerson 210
23	Collegiate School	Collegiate School	Maxwell–Dworkin G125
24	Diamond Study Centre	Diamond Study Centre	Sever 102
25	Dougherty Valley High School	DVHS Math Team	Maxwell–Dworkin G125
26	Fairfax Math Circle	Fairfax Math Circle 1	Sever 104
27		Fairfax Math Circle 2	Sever 110
28	Fairfield High Preparatory School	Fairfield High 1	Sever 109
29		Fairfield High 2	Sever 206
30	Florida	Florida A	Sever 212
31		Florida B	Science Center 309
32		Florida C	Sever 106
33	Georgetown Day School	Georgetown Day School 1	Sever 213
34		Georgetown Day School 2	Sever 110
35	Greensburg Salem High School	Team Fractal	Maxwell–Dworkin 119
36	Groton School	Groton School	Sever 205
37	Gunn	Gunn	Sever 105
38	Hamden Hall Country Day School	Hamden Hall	Pierce 209
39	Harmony School of Excellence	HSE 1	Pierce 209
40	HCSiM 2011 Alumni	Derivatives of Abelian Groups	Sever 215
41	Hotchkiss School	Hotchkiss	Pierce 100F
42	Hunter College High School	More Cowbell	Sever 102
43		These Go To Eleven	Emerson 210
44		Shanghai Foreign Language School	Sever 212
45	IDEA Math	United Idea	Maxwell–Dworkin G125
46	Illinois Math and Science Academy	IMSA	Sever 206
47		Individuals 1	Sever 202
48		Individuals 2	Sever 202
49		Individuals 3	Sever 202
50	Interlake High School	WashingtonGold	Sever 208
51	Ithaca Math Circle	Ithaca Math Circle	Sever 206

#	School	Team	Team Round
52	Kent School	Lions	Sever 111
53	Lehigh Valley	Lehigh Valley Fire	CGIS Knafel K105
54		Lehigh Valley Ice	Pierce 209
55		Lehigh Valley Lightning	Maxwell–Dworkin G135
56	Lexington High School	Lexington High School	Sever 207
57	Livingston High School	Quasi Houbenators	Sever 113
58	Loomis Chaffee School	Loomis Chaffee	Maxwell–Dworkin G135
59	Math Training Center	MTC A	Sever 112
60	BNL Gifted Math Program	BNL Hypercubes	Maxwell–Dworkin 119
61	MIST Academy	MISTerminators	Sever 111
62	Montgomery Blair High School	Montgomery Blair A	Pierce 114
63		Montgomery Blair B	Sever 110
64	Morgantown High School	Morgantown 1	Sever 210
65	Nashoba Regional High School	Nashoba 1	Sever 112
66	Needham High School	101010 (Base 2)	Sever 203
67	New York City Math Team	Murph and the Magictones	Pierce 320
68		Party Posse	Sever 113
69	JP Stevens High School	JPS Hawks	CGIS Knafel K109
70			
71	Newton South High School	Newton South Sines	Sever 211
72		Newton South Cosines	Sever 101
73	North Carolina	North Carolina	Maxwell–Dworkin 223
74	North Houston Acad of Sci and Math	North Houston	Emerson 210
75	Northfield Mount Hermon School	Hoggers	Sever 203
76	Phillips Academy	Phillips Academy 1	Sever 211
77		Phillips Academy 2	Sever 113
78	Phillips Exeter Academy	PEARL	CGIS Knafel K108
79	Pottsville Area High School	Pottsville	Emerson 105
80	Princeton High School	Little Tigers	Sever 210
81	Renmin University High School	RUHS 1	Science Center 222
82		RUHS 2	Sever 209
83	Sabio Academy	World Domination	Sever 103
84		Sabio Math	Sever 210
85	South Brunswick High School	South Brunswick Duckies	Emerson 105
86	St. Mark's School of Texas	St. Mark's School of Texas A	Sever 204
87	The Lawrenceville School	The Lawrenceville School	Emerson 105
88	Thomas Jefferson HS for Sci and Tech	Thomas Jefferson A	CGIS Knafel K106
89		Thomas Jefferson B	Sever 209
90		Thomas Jefferson C	Sever 203
91	Twin Cities All-Stars	Twin Cities West	Sever 102
92		Twin Cities East	Sever 106
93	Upper Canada College	UCC	Sever 208
94	Ward Melville High School	Ward Melville Team A	Emerson 105
95	Wasatch Academy	Wasatch Academy A1	Sever 106
96		Wasatch Academy B1	Sever 103
97	West Windsor-Plainsboro HS North	Knights A	Sever 215
98		Knights B	Emerson 210
99	West Windsor-Plainsboro HS South	WW-P Pirates	Sever 109
100	Westborough High School	Westborough HS	Emerson 105
101	Western Mass ARML	Western Mass ARML All Stars	Sever 207
102			
103	Western PA	Western PA	Sever 201

Schedule of Events

Time	Event	Location
All Day	Coach/Parent Lounge Lost & Found, Protests	Holden Chapel Sci Center 109
8:00–8:45am	Registration	Science Center Lobby
8:00–8:45am	Breakfast	Science Center Lobby
9:00–12:00pm	Individual Rounds	Sci Center A (Teams 1–10) Sci Center B (Teams 11–43) Sci Center C (Teams 44–66) Sci Center D (Teams 67–82) Emerson 105 (Teams 83–103)
10:00–10:30am	Proctor Meeting	Emerson 210
12:30–1:30pm	Team Round	Various
1:30–2:30pm	Lunch	Harvard Square
3:00–4:30pm	Guts Round	Sci Center B (Teams 1–48) Sci Center C (Teams 49–82) Sci Center D (Teams 83–103)
5:00–5:30pm	Awards Ceremony Awards Overflow	Sci Center B Sci Center C

Rules Highlights

<http://web.mit.edu/hmmt/www/rules.shtml>

Calculators and Computational Aids

You may not use books, notes, calculators, pocket organizers, slide-rules, abaci, or any other computational aids. Similarly, you may not use graph paper, rulers, protractors, compasses, architectural tools, or any other drawing aids. **Translators are also prohibited.** Translation sheets will be available upon request.

Grading Policy

- Answers must be simplified and exact unless otherwise specified.
- Rational numbers should be given in lowest terms.
- An n^{th} root should be simplified so that the radicand contains no fractions and is not divisible by the n^{th} power of any prime.
- Denominators do not need to be rationalized.
- Correct mathematical notation must be used.
- *No* partial credit will be given unless otherwise specified.

Protests

If a student believes that an answer given on the answer key for a morning event is incorrect, an appeal must be submitted in Science Center 109 by 2:00 pm.

Decisions of the coordinators of the Harvard-MIT Mathematics Tournament are final.

