



THE WILLIAM LOWELL PUTNAM MATHEMATICAL COMPETITION

ANNOUNCEMENT OF WINNERS

of the forty-sixth annual competition held on December 7, 1985

WINNING TEAMS

<i>Rank</i>	<i>School</i>	<i>Team Members (in alphabetical order)</i>
1	HARVARD UNIVERSITY	Glenn D. Ellison*, Douglas S. Jungreis*, Michael Reid*
2	PRINCETON UNIVERSITY	Michael A. Abramson*, Douglas R. Davidson*, James C. Yeh*
3	UNIVERSITY OF CALIFORNIA, BERKELEY	Michael J. McGrath*, David P. Moulton*, Jonathan E. Shapiro
4	RICE UNIVERSITY	Charles R. Ferenbaugh, Thomas M. Hyer*, Thomas M. Zavist*
5	UNIVERSITY OF WATERLOO	David W. Ash*, Yong Yao Du, Kenneth W. Shirriff

The first place team receives an award of \$5,000 and each member of the team receives \$250. The awards for second place are \$2,500 and \$200; for third place \$1,500 and \$150; for fourth place \$1,000 and \$100; and for fifth place \$500 and \$50.

In each of the following categories, the listing is in alphabetical order.

THE PUTNAM FELLOWS — THE FIVE HIGHEST RANKING INDIVIDUALS

Each receives an award of \$500.

MARTIN V. HILDEBRAND	Williams College
EVERETT W. HOWE	California Institute of Technology
— DOUGLAS S. JUNGREIS	Harvard University
— BJORN M. POONEN	Harvard University
— KEITH A. RAMSAY	University of Chicago

THE NEXT FIVE HIGHEST RANKING INDIVIDUALS

Each receives an award of \$250.

DAVID W. ASH	University of Waterloo
— WALDEMAR P. HORWAT	Massachusetts Institute of Technology
— REG J. KUPERBERG	Harvard University
— JOHN M. STEINKE	Rice University
— DAVID I. ZUCKERMAN	Harvard University

HONORABLE MENTION — TEAMS

CALIFORNIA INSTITUTE OF TECHNOLOGY	Leland F. Brown, Art Duval, Daniel E. Loeb
RENSSELAER INSTITUTE OF TECHNOLOGY	Brenden A. Del Favero, John D. Moores, Bart C. Vashaw
RUTGERS UNIVERSITY, NEW BRUNSWICK	Scott E. Axelrod, Liaw Huang*, William M. Wells
WASHINGTON UNIVERSITY, ST. LOUIS	Anders W. McCarthy, Daniel N. Ropp*, Dougin A. Walker*
YALE UNIVERSITY	Thomas Andrews, Ramzi R. Khuri, David R. Steinsaltz

HONORABLE MENTION — INDIVIDUALS

— MICHAEL A. ABRAMSON, Princeton University	— DAVID J. MOEWS, Harvard University
JORG ANTHONY BROWN, Colorado State University	DAVID P. MOULTON, University of California, Berkeley
GLENN G. CHAPPELL, University of Kansas	LEE A. NEWBERG, Massachusetts Institute of Technology
STANLEY CHEN, California Institute of Technology	KEN E. NEWMAN, Washington University, St. Louis
JOHN J. CHEW, University of Toronto	STEVE NEWMAN, University of Michigan, Ann Arbor
— CONSTANTINE N. COSTES, Harvard University	— MICHAEL REID, Harvard University
— DOUGLAS R. DAVIDSON, Princeton University	DANIEL N. ROPP, Washington University, St. Louis
— GLENN D. ELLISON, Harvard University	— RANDALL G. ROSE, Princeton University
ADAM F. FALK, University of North Carolina, Chapel Hill	DAVID B. SECREST, University of Illinois, Champaign-Urbana
CHRISTOPHER P. GRANT, Brigham Young University	ROBERT E. SHAPIRE, Brown University
MARK C. HAMBURG, University of Michigan, Ann Arbor	RANDALL D. SMITH, University of Chicago
LIAW HUANG, Rutgers University, New Brunswick	ERIC H. VEACH, University of Waterloo
THOMAS M. HYER, Rice University	MINH TUE VO, University of Waterloo
WILLIAM CARL JOCKUSCH, Carleton College	DOUGIN A. WALKER, Washington University, St. Louis
DANIEL W. JOHNSON, Rose-Hulman Institute of Technology	CHRISTOPHER S. WELTY, University of California, Berkeley
JAMSHID MAHDAVI, Carnegie-Mellon University	— JAMES C. YEH, Princeton University
MICHAEL J. McGRATH, University of California, Berkeley	THOMAS M. ZAVIST, Rice University

A total of 2,079 students from 348 colleges and universities in Canada and the United States participated in the Competition. There were teams from 264 institutions. More complete details will appear in the American Mathematical Monthly.

March 1, 1986

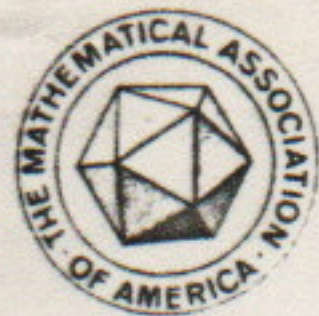
Leonard F. Klosinski, Director; Gerald L. Alexanderson and Loren C. Larson, Associate Directors

Leonard F. Klosinski, Director

THE WILLIAM LOWELL PUTNAM MATHEMATICAL COMPETITION

University of Santa Clara

Santa Clara, California 95053



Telephone: (408) 984-4526

March 1, 1986

Dear Professor:

Enclosed is a report on your contestants in the 46th Competition and your team rank (if it was in the range 1-150), a list of the top 501 contestants (which you may wish to share with your committee on graduate students), an announcement of winners, and a list of participating schools. Some tables are given below. Your contributions to the Competition are greatly appreciated.

Sincerely yours,

Leonard F. Klosinski, Director
 Gerald L. Alexanderson, Associate Director
 Loren C. Larson, Associate Director

Score	Rank	Score	Rank	Score	Rank	Score	Rank	Score	Rank
108	1	69	37.5	49	124.5	37	206	18	510.5
100	2	68	41	48	129	36	215	17	525
94	3.5	67	43	47	133	35	224	16	538.5
91	5	66	44	46	139.5	34	231.5	15	550.5
89	6.5	65	46	45	145	33	240.5	14	558.5
88	8	64	48	44	150	32	253.5	13	571
87	9	63	50.5	43	154	31	267.5	12	600
85	10	62	54	42	157.5	30	286	11	650
82	11	61	57	41	162	29	306.5	10	735.5
81	12.5	60	61	40	165.5	28	326.5	9	812
80	14.5	59	67	39	172.5	27	343	8	848.5
79	17	58	72.5	38	180	26	354	7	872
78	19	57	77.5	37.9	184.5	25	362.5	6	893.5
77	20	56	82	37.8	188	24	370	5	912.5
76	21.5	55	89	37.7	191	23	379.5	4	924
75	23.5	54	98.5	37.6	193	22	393.5	3	944
74	26	53	104.5	37.5	194	21	408.5	2	1009
73	28	52	108.5	37.4	197	20	441.5	1	1164.5
72	30.5	51	114.5	37.3	200	19	485	0	1674
70	34	50	120	37.2	201				

Handwritten notes: 35, 38, 80, 300, 1574

FREQUENCY DISTRIBUTION OF PROBLEM SCORES OF THE TOP 201 CONTESTANTS

	A-1	A-2	A-3	A-4	A-5	A-6	B-1	B-2	B-3	B-4	B-5	B-6	Total
10	125	29	100	72	44	8	112	3	95	115	14	5	722
9	6	15	5	30	2	2	29	89	15	30	8	0	231
8	0	31	18	6	7	0	0	3	15	9	2	0	91
7	0	14	0	23	5	0	0	1	11	1	2	0	57
6	0	38	0	0	0	0	0	0	0	2	0	0	40
5	0	11	0	0	0	0	0	0	0	6	0	4	21
4	0	2	0	0	0	0	0	0	0	4	0	0	6
3	0	15	0	0	0	0	0	0	0	0	0	0	15
2	0	6	2	1	10	3	0	2	5	9	2	9	49
1	0	4	10	5	27	19	30	11	3	8	2	7	126
0	61	21	19	33	46	22	13	37	23	11	61	26	373
-	9	15	47	31	60	147	17	55	34	6	110	150	681

Handwritten note: 2081