

Ontario Mathematics Competition 2023

Results



Ontario Competitive
Mathematics Committee

Acknowledgements

Thank you to all the students who wrote, the proctors who administered, and the teachers who supervised OMC 2023. We hope that you enjoyed the contest and the challenges that it provided. We hope you continue following your interest in competitive mathematics and wish to see you again in the OMC next year.

We would also like to thank all those participants who responded to our feedback form. We have read all of your valuable inputs, and they will be a great help for improving OMC in the future. The AoPS coupons have been raffled and released to two of the participants. If you are one of the lucky responders, we hope these coupons will help you further your interest in mathematics.

Finally, we would like to say a huge thank you to the following companies for their generous support: TT Math, Art of Problem Solving, and Wolfram Research. Their considerable investment made it possible for us to reach out to more students and make a positive impact on their mathematical learning journeys. Without their contribution, the OMC could not have been nearly as successful. Thank you to all our sponsors, and we hope to see them again next year!

Atticus Zhang
Co-Director of Operations,
Ontario Competitive Mathematics Committee

Thank you again to our sponsors:



AoPS
Art of Problem Solving



WOLFRAM

Comments on the Paper

Overall Comments

To all of the participants in the 2023 Ontario Mathematics Competition, congratulations. The overall average score was 94.3. We were pleased to see that despite the difficulty of the OMC, there was a lot of success in solving these problems. At the same time, later OMC problems managed to challenge the very top students. By some metrics, OMC 2023 exceeds even AMC 12 and Euclid in difficulty, so there is no need to be alarmed if later problems prove too difficult.

Specific Comments (for OMC Part II)

1. Average: 24.2
Very well done. A common mistake in part (b) was forgetting the distributive property when expanding brackets. For part (c), the most common errors involve incorrectly rearranging and solving the quadratic.
2. Average: 7.8
In part (a), many contestants did not count the number of possible last two digits correctly; some used 0s, which was not an acceptable digit, or used repeating digits. A common misconception about part (b) was that B must not equal C , and this led to nine missed cases in the final answer. Very few contestants solved part (c); a common mistake was assuming that all differences had equal probability, which gave answers that were very different from the correct one.
3. Average: 3.4
Unfortunately, many contestants submitted approximate answers for part (a), which we were not able to award partial marks for.
Most contestants approached part (b) as an infinite geometric sequence, but there were some errors when calculating the ratio. Common mistakes include assuming that the diameter of P_2 covered the entire remaining distance between P_1 and the centre of O , or forgetting to square the ratio of the radii to find the ratio of the areas of the infinite set.
4. Average: 0.7
For part (a), many contestants didn't consider the so-called "point-wise trap," where the function is a piecewise function between a quadratic and a sine. Very few contestants attempted parts (b) and (c).

Please visit our website at <https://sites.google.com/view/ontariocmc> to download the OMC 2023 contest, plus full solutions.

Outstanding Performers

Overall Awards

Champion	Charles Ran	Oakville Trafalgar High School	Grade 11
Second	Jay Ren	Laurel Heights Secondary School	Grade 12
Third	Yingshan Xiao	Oakville Trafalgar High School	Grade 10

Junior Awards

Champion	Michael Li	Iroquois Ridge High School	Grade 10
Second	Kenny Zhang	Saint Theresa of Lisieux CHS	Grade 9
Third	Andrew Lin	Marc Garneau Collegiate Institute	Grade 10

Each award winner will receive a cash prize between \$15 to \$30 and a one year subscription to Wolfram Alpha generously donated by TT Math and Wolfram Researches.

Top Multiple Choice Scorers

Champion	Charles Ran	Oakville Trafalgar High School	Grade 11	110/125
Second	Bohyun Kang	Iroquois Ridge High School	Grade 12	101/125
	Patrick Chen	Saint Robert CHS	Grade 9	101/125
Fourth	Kenny Zhang	Saint Theresa of Lisieux CHS	Grade 9	99/125
Fifth	Jay Ren	Laurel Heights Secondary School	Grade 12	98/125
	Antian Jiang	Marc Garneau Collegiate Institute	Grade 10	98/125
Eighth	Oscar Zhou	White Oaks Secondary School	Grade 10	98/125
	Jeremy Dai	Marc Garneau Collegiate Institute	Grade 11	95/125
	Andrew Lin	Marc Garneau Collegiate Institute	Grade 10	95/125
	Aidan Zhang	Iroquois Ridge High School	Grade 11	95/125

Top Long Answer Scorers

Champion	Charles Ran	Oakville Trafalgar High School	Grade 11	93/125
Second	Jay Ren	Laurel Heights Secondary School	Grade 12	80/125
	Yingshan Xiao	Oakville Trafalgar High School	Grade 10	80/125
Fourth	Michael Li	Iroquois Ridge High School	Grade 10	71/125
Fifth	Jeremy Dai	Marc Garneau Collegiate Institute	Grade 11	68/125
	Jason Sun	Iroquois Ridge High School	Grade 9	68/125
	Ansh Agarwal	Marc Garneau Collegiate Institute	Grade 9	68/125
Eighth	Teja Peddi	Laurel Heights Secondary School	Grade 11	67/125
Ninth	Bohyun Kang	Iroquois Ridge High School	Grade 12	65/125
	Harrison Liu	Abbey Park High School	Grade 12	65/125

School Awards

Champion	Iroquois Ridge High School	Oakville, ON
Second	Oakville Trafalgar High School	Oakville, ON
Third	Marc Garneau Collegiate Institute	Toronto, ON

Participation and Student Ranking

Participation

Number of schools registered: 10

Total number of students participated: 224

Student Ranking

Score	Rank	Score	Rank	Score	Rank
203	1	118	55	75	152
178	2	116	57	73	158
169	3	115	60	72	160
166	4	114	61	71	161
165	5	111	65	70	163
163	6	110	67	69	172
159	7	109	69	68	174
157	8	108	73	67	176
155	9	107	75	65	177
153	10	106	77	64	181
152	13	105	79	63	185
150	15	104	81	62	188
148	16	103	84	61	189
143	17	102	88	60	190
142	18	101	94	58	193
141	20	100	100	57	196
140	23	99	104	56	198
138	24	98	107	55	199
137	26	96	108	53	203
135	27	95	113	50	206
134	29	94	114	47	208
133	30	93	115	45	209
130	31	92	117	43	210
129	34	90	120	42	211
128	35	89	122	40	213
127	39	88	125	39	216
126	42	86	128	37	217
125	44	85	132	31	218
124	45	82	134	30	219
122	48	80	136	28	220
121	51	79	143	25	221
120	53	77	147	24	222
119	54	76	149	22	223

School Ranking

Ontario Mathematics Competition 2023 School Ranking

Ranking	School	City	Score
1	Iroquois Ridge High School	Oakville, ON	762
2	Oakville Trafalgar High School	Oakville, ON	743
3	Marc Garneau Collegiate Institute	Toronto, ON	729
4	The Woodlands Secondary School	Mississauga, ON	723
5	Saint Robert Catholic High School	Markham, ON	706
6	Saint Theresa of Lisieux Catholic High School	Richmond Hill, ON	697
7	White Oaks Secondary School	Oakville, ON	668
8	Laurel Heights Secondary School	Waterloo, ON	656
9	Abbey Park High School	Oakville, ON	651
10	John Fraser Secondary School	Mississauga, ON	608

N.B. The school score is calculated as the sum of the top five scorers in the school.

Honour Roll

**Ontario Mathematics Competition 2023
Overall Student Honour Roll**

Name		Score	School	Grade
Group I		99-100 Percentile		
Charles	Ran	203	Oakville Trafalgar High School	11
Jay	Ren	176	Laurel Heights Secondary School	12
Yingshan	Xiao	169	Oakville Trafalgar High School	10
Group II		96-98 Percentile		
Bohyun	Kang	166	Iroquois Ridge High School	12
Michael	Li	165	Iroquois Ridge High School	10
Jeremy	Dai	163	Marc Garneau Collegiate Institute	11
Kenny	Zhang	159	Saint Theresa of Lisieux Catholic High School	9
Kevin	Wang	157	The Woodlands Secondary School	12
Andrew	Lin	155	Marc Garneau Collegiate Institute	10
Group III		90-95 Percentile		
Jason-Qiran	Sun	153	Iroquois Ridge High School	9
Helen	Huang	153	John Fraser Secondary School	10
Antian	Jiang	153	Marc Garneau Collegiate Institute	10
Andrew	Zheng	152	Saint Robert Catholic High School	10
Jeffrey	Hu	152	Saint Robert Catholic High School	10
Harrison	Liu	150	Abbey Park High School	12
Aidan	Zhang	148	Iroquois Ridge High School	11
Purav	Gupta	143	The Woodlands Secondary School	12
Arina	Kurbatova	142	The Woodlands Secondary School	9
Teja	Peddi	142	Laurel Heights Secondary School	11
Jerry	Yang	141	Marc Garneau Collegiate Institute	9
Oscar	Zhou	141	White Oaks Secondary School	10
Cheng Yi	Yang	141	The Woodlands Secondary School	12
Andrew	Sun	140	White Oaks Secondary School	11

Honour Roll

Ontario Mathematics Competition 2023 Junior Student Honour Roll

Name		Score	School	Grade
Group I		99-100 Percentile		
Yingshan	Xiao	169	Oakville Trafalgar High School	10
Michael	Li	165	Iroquois Ridge High School	10
Kenny	Zhang	159	Saint Theresa of Lisieux Catholic High School	9
Group II		96-98 Percentile		
Andrew	Lin	155	Marc Garneau Collegiate Institute	10
Jason-Qiran	Sun	153	Iroquois Ridge High School	9
Helen	Huang	153	John Fraser Secondary School	10
Antian	Jiang	153	Marc Garneau Collegiate Institute	10
Group III		90-95 Percentile		
Andrew	Zheng	152	Saint Robert Catholic High School	10
Jeffrey	Hu	152	Saint Robert Catholic High School	10
Arina	Kurbatova	142	The Woodlands Secondary School	9
Jerry	Yang	141	Marc Garneau Collegiate Institute	9
Oscar	Zhou	141	White Oaks Secondary School	10
Evan	Zhang	138	Saint Robert Catholic High School	10
Jiahao	Yu	135	Oakville Trafalgar High School	10
Daniel	Qiu	135	Saint Robert Catholic High School	10
Pritika	Lahiri	134	The Woodlands Secondary School	10
Brandon	Lam	133	Saint Theresa of Lisieux Catholic High School	10