

2025 Math Attack Summer Camp for Girls

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Friday, July 4th – Sunday, July 6th, 2023



1 Description

The 2025 Math Attack Summer Camp for Girls was an 8-day overnight camp that was held at the University of Calgary and the Banff International Research Station (BIRS) from Sunday, June 29th - Sunday, July 6th. The camp brought 21 grades 7 - 10 students who identify as girls together to engage in fun mathematical activities and build connections. Students stayed in the university residence for the first five nights of the camp and stayed at the Banff Centre for the last two nights.

The camp aimed to encourage girls to pursue their passion for mathematics and make connections with peers who shared similar interests. Throughout the week, students engaged in mathematical sessions that explored topics such as cryptology, game theory, optimization, statistics, and actuarial science. They investigated how x-ray machines work using tomography techniques, engaged in a Math Murder Mystery, and

competed in a math-based Escape Room. These sessions exposed students to 13 female role models, including recent high school graduates, undergraduate math students, graduate math students, mathematics faculty, and mathematicians in industry.

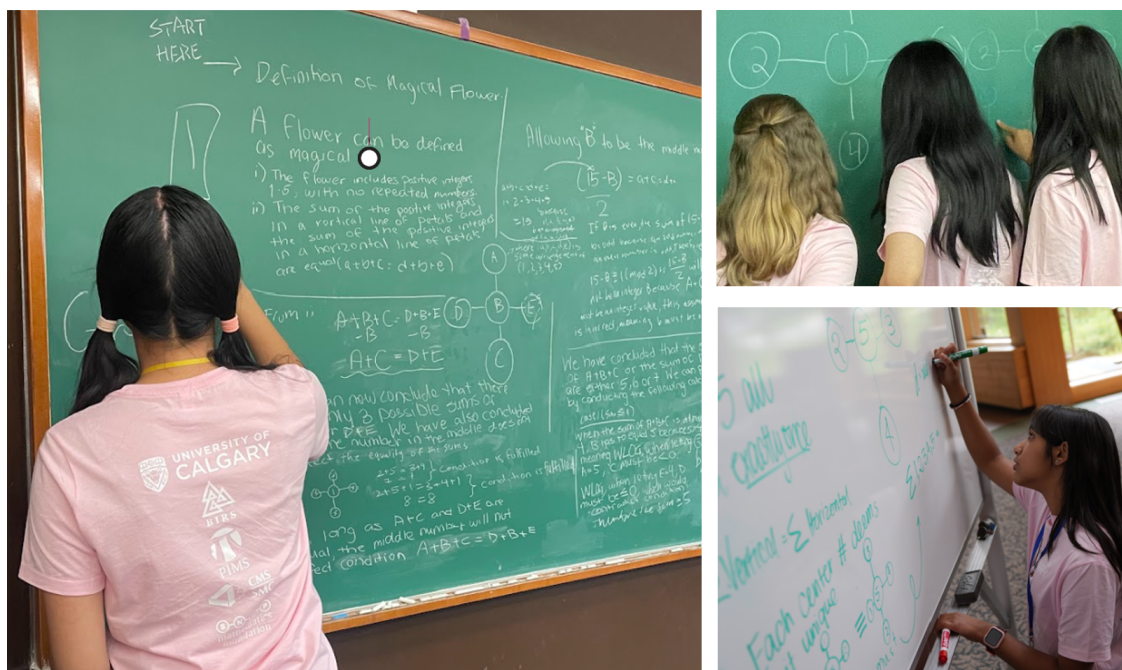
During the camp, there was also plenty of time for friendship building and physical activity. Evening activities included sports, swimming, board games, karaoke, and a walk along Bow Falls Trail. On Friday, students also took some time to explore the town of Banff and hiked up Tunnel Mountain.

2 Schedule

Time	Sunday June 29 th	Monday June 30 th	Tuesday July 1 st	Wednesday July 2 nd	Thursday July 3 rd	Friday July 4 th	Saturday July 5 th	Sunday July 6 th
8 – 9am		Breakfast	Breakfast	Breakfast	Breakfast	Breakfast	Breakfast	Checkout + Breakfast
9 – 10:15am		The Art of Crafting Secret Messages: Bridging the Past and Present in Coding (Mayada Shahada)	Optimization (Gabriel Jarry-Bolduc)	Math Murder Mystery (Danika Lipman, Placida Dassanayake, Thuntida Ngamkham)	Monty Hall (Vince Chan)	Finish Packing (9 – 9:45am)	Mathematical Communication (Lauren DeDieu)	Two-Player Games (Dami Wi)
10:15 – 10:30am		Break	Break	Break	Break	Bus to Banff (9:45am)		Break
10:30 – 11:45am		The Art of Crafting Secret Messages: Bridging the Past and Present in Coding (Mayada Shahada)	Optimization (Gabriel Jarry-Bolduc)	Math Murder Mystery (Danika Lipman, Placida Dassanayake, Thuntida Ngamkham)	When Cooperation Feels Like a Risk (Vince Chan)		Group Photo + Lunch	Feedback + Closing Ceremony
11:45am – 1pm		Lunch	Lunch	Lunch	Lunch	Explore Banff (<i>participants purchase their own lunch</i>)		Lunch
1 – 2:15pm		Cryptology (Lauren DeDieu)	Dirichlet's Principle (Elena Braverman)	Game Theory (Vincent Macri)	Central Limit Theorem (Nancy Chibry)	Hike (Tunnel Mountain)	The Pirate's Puzzle Quest (Dami Wi)	Bus to Calgary (1pm)
2:15 – 2:30pm		Break	Break	Break	Break			Departure (2:30 – 3pm, International House)
2:30 – 3:45pm		What Are the Chances? An Intro to Probability (Saba Saghatchi)	An Introduction to Tomography (Tracey Balehowsky)	Quadratic Reciprocity (Milad Fakhari)	Math Jeopardy (Lauren DeDieu)			
3:45 – 4pm		Feedback	Feedback	Break	Feedback		Feedback	
4 – 5:30pm		Free Time	Free Time	Actuarial Science (Ella Charpentier)	Free Time	Check-in/ Free Time	Free Time	
				Feedback (5:15 – 5:30pm)				
5:30 – 6:30pm		Dinner	Dinner	Explore University District (<i>participants purchase their own dinner</i>)	Dinner	Dinner	Dinner	
6:30 – 9pm	Arrival (6:30 – 7:30pm, Aurora Hall)	Movie	Sports	Board Games	Karaoke/ Dance Party	Free Time	Walk (Bow Falls Trail)	
	Ice Breaker Activities (7:30 – 9pm, MS 431)							

3 BIRS Highlights

The focus of Saturday morning was mathematical exploration and communication. We discussed how creativity lies at the heart of mathematics and how mathematicians create new mathematics by making and refining conjectures. We also discussed the importance of communicating results precisely, using correct notation and prose to help the reader navigate. In groups, students engaged in a mathematical exploration activity where they explored ‘magic flowers’. Students made conjectures about what magic flowers could look like and worked to classify them all. They then worked to communicate their results as precisely as possible and shared their results with their fellow campers. This session was led by Lauren DeDieu.



On Saturday afternoon, students engaged in a 3-hour-pirate-themed mathematical escape room designed by Dami Wi. Stations were set up at various outdoor locations at the Banff Centre (e.g., Shaw Amphitheater, outside of the TransCanada Pipelines Pavilion). At each station, students completed a mathematical puzzle then moved to the next station. The goal was to figure out the route to *Treasure Island*.

On Sunday morning, students engaged in a game theory session led by Dami Wi, where students engaged in two-player games and worked to find a winning strategy. The day wrapped up with a Closing Ceremony where students were awarded certificates and prizes.

Over the weekend, students also took some time to explore the town of Banff. On Friday afternoon they hiked up Tunnel Mountain, and on Saturday evening they went for a walk along Bow Falls Trail.



4 Outcomes of the Meeting

This camp helped inspire our female participants to pursue their passion for mathematics by making connections with female role models and peers who share similar interests. This is reflected in the following quotes from our participants:

- 10/10!! I already knew I liked math before joining the camp, but after attending I want to explore even more branches of mathematics and strengthen my knowledge from the lectures. Seeing and learning from female mathematicians was one of the best parts of this experience because I could see myself being like them in the future. At my school, there aren't a lot of other math invested girls, so the most memorable part of this experience was the new likeminded friends I made.
- This camp has changed the way I think about mathematics. I definitely want to explore even more branches of mathematics, and now I'm considering a degree related to mathematics.
- It was really REALLY fun!!! There were so many chances to connect with others and build long lasting relationships with them.
- This camp definitely encouraged me to pursue my dream of becoming a biomedical engineer, it helped me meet new people who are just as interested in math as I am, and it also did expose me to female role models who really inspired me through this journey.
- Before, I used to just give up when math was hard, but this camp made me realize that it's more satisfying to work harder and reach a solution.
- I've learned so much more about what math really does in the real world, in banks, emails, and even this typing. The camp was such an eye opening experience and I've become much more familiar with number theory and other math topics.
- This camp really inspired me to be creative and think outside the box. It also allowed me to expand my knowledge in the subject and helped me realize that mathematics was much more diverse than I imagined it to be.
- I loved the vibes of this camp, because everyone was extremely focused during lectures and participated in group activities. In the evening, we had many walks, sports, movies, and boardgames which helped us bond. I made many good friends at this camp, and if I could, I would totally want to go to similar camps in the future.
- My relationship with math felt strained while in communities where math is strictly competitive. Here, however, without the pressure from others to win or get everything right, where not knowing something yet is okay because it would lead to questions, made my math journey more free and broadened.
- This camp I think really helped putting a career in mathematics into perspective for me. Before I just thought it would be learning about it further in college, but now I know how much diversity is within the field, and it differently increased my passion for math!
- Amazing, thrilling, beautiful, spectacular, and all around awesome!!!
- IT WAS SO FUN! I really enjoyed everything, and got a chance to step out of my comfort zone whether it's in math, socializing or food.

5 Additional Information

Additional photos and information about the camp can be found in the *Final Report* available here: <https://science.ualgary.ca/mathematics-statistics/engagement/educational-outreach/math-attack>.