2022 Math and AI 4 Girls Award Ceremony

Welcome, all!
For today, I would recommend having a pen, paper and phone ready!

Thank you to our sponsors and partners!

Deanna Kwong

Director, Office of Operations, Legal and Administrative Affairs
## Hewlett Packard Enterprise

Deanna Kwong is a Director in the Office of Operations, Legal, and Administrative Affairs at Hewlett Packard Enterprise Company (HPE). She is a lawyer by background and has practiced technology and intellectual property law for almost twenty years. Deanan serves on the HPE CEO's Executive Inclusion and Diversity Council. Recently, Deanna was named as one of the most influential women in Silicon Valley in 2022, by Silicon Valley Business Journal.

Antonio Neri,

President and CEO,
## Hewlett Packard Enterprise
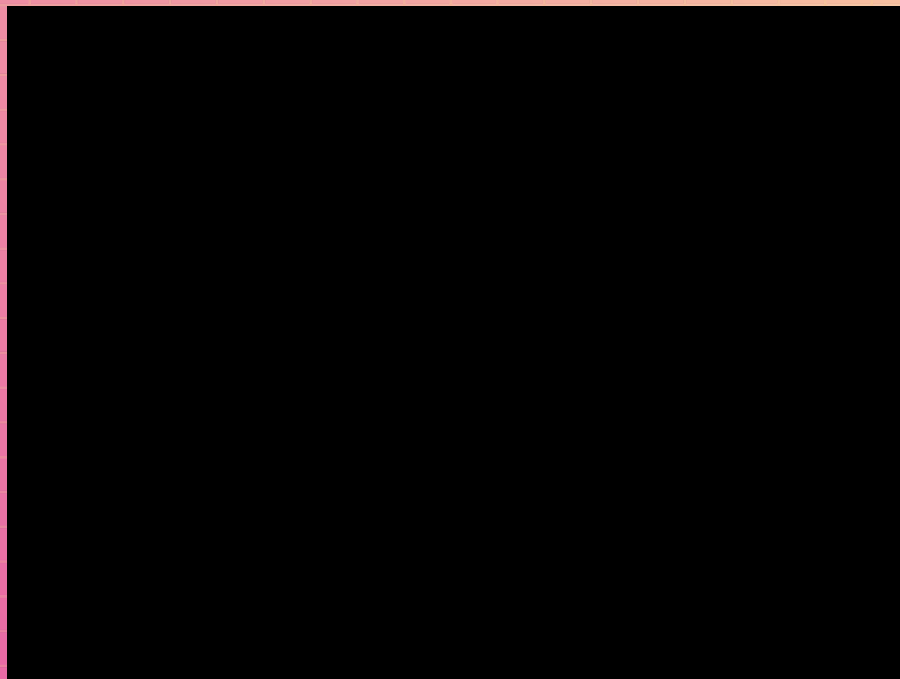
Today's Agenda, part 1

Name	Activity
Natalie Shell	Introduction and tour
Deanna Kwong (Director, Office of Operations, Legal, & Administrative Affairs at HPE)	Speech on behalf of HPE
Antonio Neri (CEO of HPE)	Congratulatory video to all participants
Team MAA4G	Competition statistics and info
Team MAA4G	Interactive activity 1

Today's Agenda, part 2

Name	Activity
Neeti Mehta Shukla (Co-founder of Automation Anywhere)	Congratulatory video to all participants
Dr. Jamie Wells (Adjunct Professor, Drexel University. Director of RSI 2021)	Speech on her own journey in STEM, Q&A session
Team MAA4G	Interactive activity 2
Team MAA4G	Announcement of winners
Natalie Shell	Closing

Competition Data

~5000 ➡ 400+
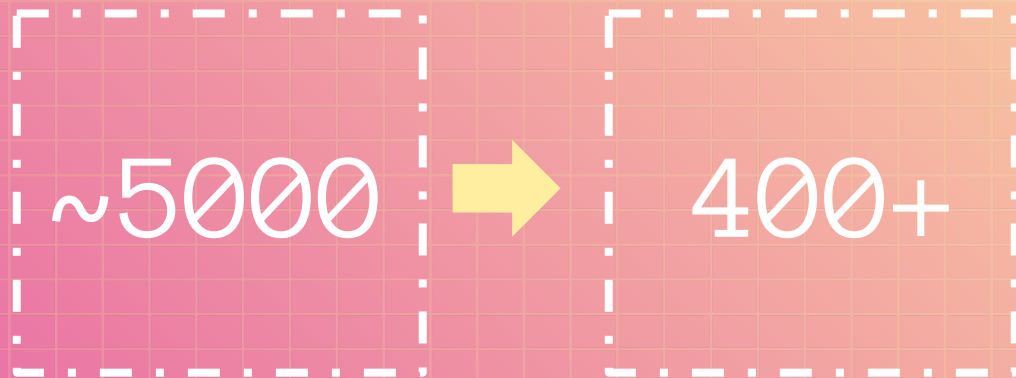
Views on the MathandAI4 Girls website

Draft Submissions

Competition Data

A quick summary of our entries by grade and state!

Competition Data

Common hobbies and activities!

Common Contests	Number
MathCounts	45
AMC 8/10	52
AIME	19
USAJMO	4
USACO	11

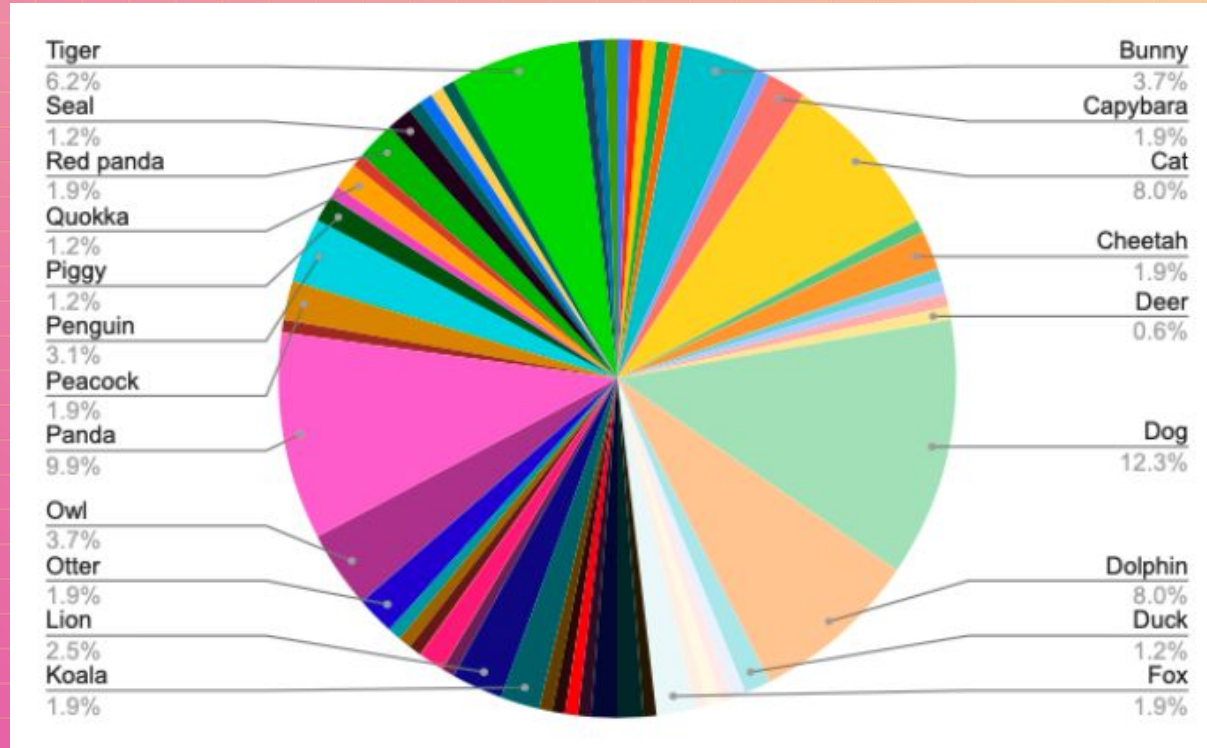| Hobbies	Number
Piano	28
Violin	28
Swimming	19
Video Games	16
Dance	14
Robotics	11

We also have contestants who are...

3-time gold medalist, Houston Open Taekwondo Tournament.

Top 3 in her age group nationally in chess.

Runs her own business on Etsy.

Favorite animals

Favorite animals... cleaned up

The Winners :

Animal Name	Votes
Dog	20
Panda	16
Cat	13
Dolphin	13
Tiger	10

Most Interesting:

Quokka
Kahyeon Jeon
Monica Chen

Oriental Dwarf Kingfisher
Aylin Hernandez

Shiba Inu
Eliane Martel
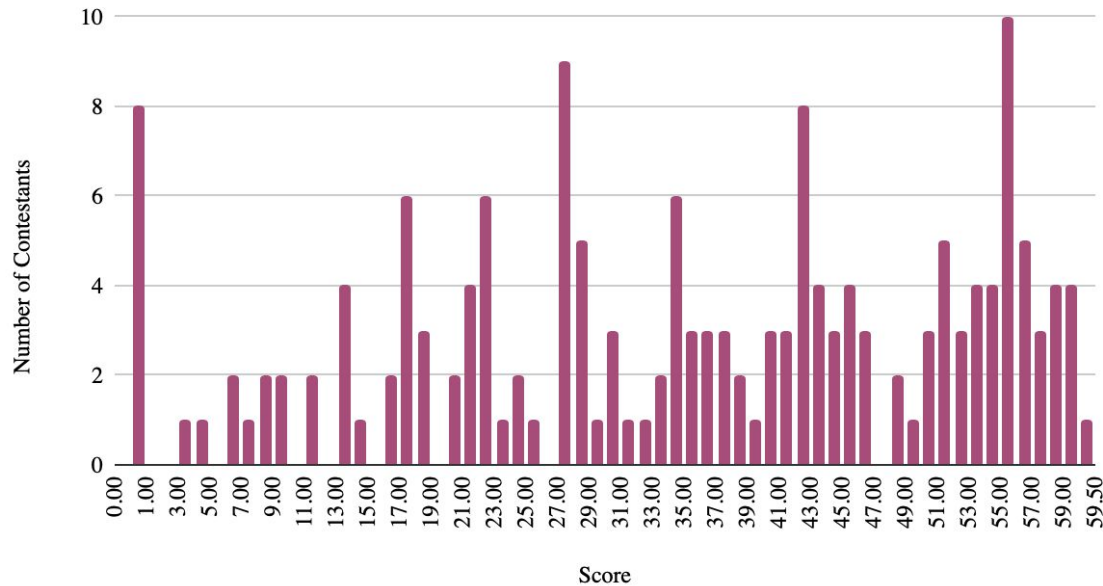

Axolotl
Mahleej Shahzad

Shiny Pigtoe
Yunong Wu

Using your words...
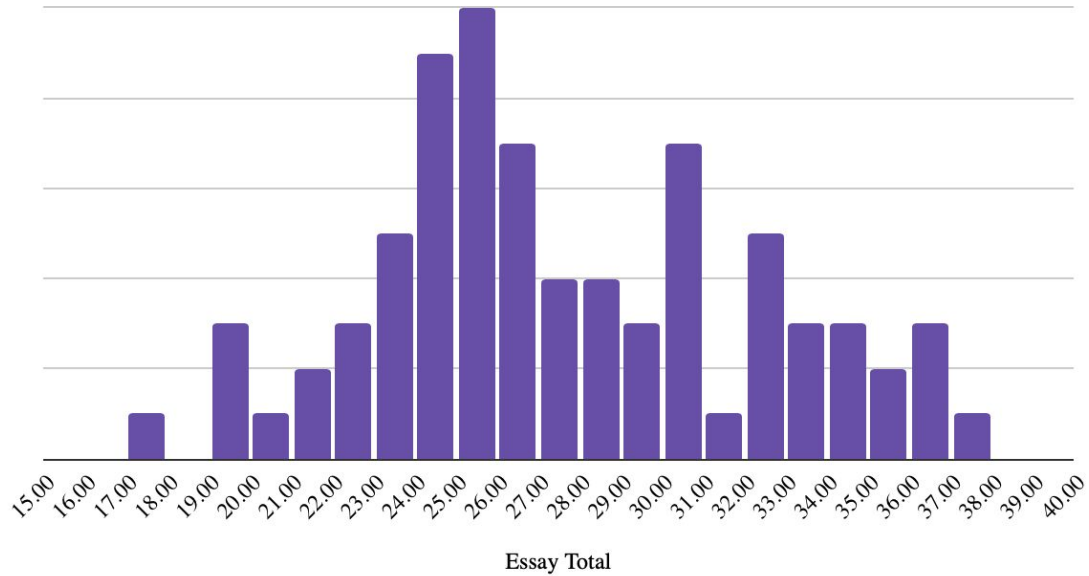
A word cloud generated from your essays!

Problem Set Scores

Problem Set Scores

Min	0
Q1	22.3
Mean	35
Median	36.4
Q3	51.1
Max	59.5

Essay Scores

Essay Scores

Min	17
Q1	24
Mean	27.3
Median	26
Q3	30
Max	37.3

Let's play a game!
Test your math ability!

www.kahoot.it

Game pin: **9441346**

"Nickname": Use your full, real name

Go to this website
on a separate device!

www.kahoot.it

Game pin: 9441346

"Nickname": Use your full, real name
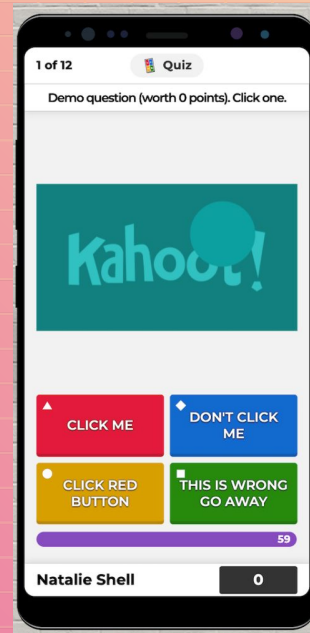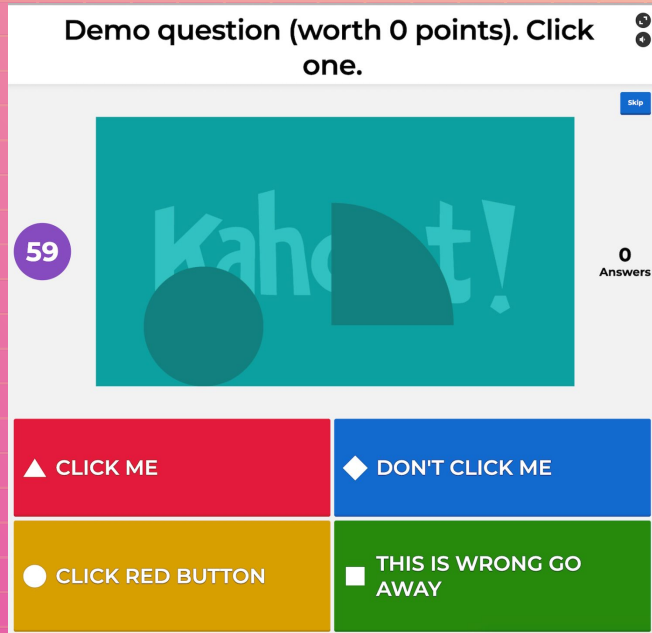
Neeti Mehta Shukla

Co-Founder and Social Impact Officer
Automation Anywhere

Neeti Mehta Shukla is a co-founder, senior vice president and culture architect at Automation Anywhere – the world's most widely deployed and only cloud-native robotics process automation (RPA) platform. She has dedicated her career to liberating people from the restrain of manual, repetitive work. RPA enables an intelligent digital workforce of software robots that can automate the mundane, unleash human creativity, and ultimately make work more human.

Neeti Mehta Shukla

Dr. Jamie Wells

Adjunct Professor, Advisory Leadership Board Member
Drexel University
Director of RSI 2021

Dr. Wells is an adjunct professor at Drexel University's School of Biomedical Engineering, Science and Health Systems. She has a special interest in pediatric engineering, patient safety and optimizing care delivery, bioethics, public health and policy, science communications, and medtech innovation, bridging interdisciplinary knowledge gaps to prevent medical error and expedite discovery.

Last year, she served as the director of the Research Science Institute (RSI) collaboratively sponsored by the Massachusetts Institute of Technology (MIT) and the Center for Excellence in Education (CEE).

Additionally, she is an award-winning Board-certified physician. She is also the President and Founder of the Yale Alumni Health Network and an Ambassador in Healthcare for the Global Blockchain Business Council. She is on the leadership council of the Wistar Institute.

You may have guessed it...
Let's play another game!

www.kahoot.it
Game pin: **6504456**
"Nickname": Use your full, real name

Go to this website!

Award Categories

1st
2nd
3rd

4th
5th

6th–10th

"High honors"
(11th–20th)

"Honorable mention"
(21st–50th)

Rising stars

Special Awards
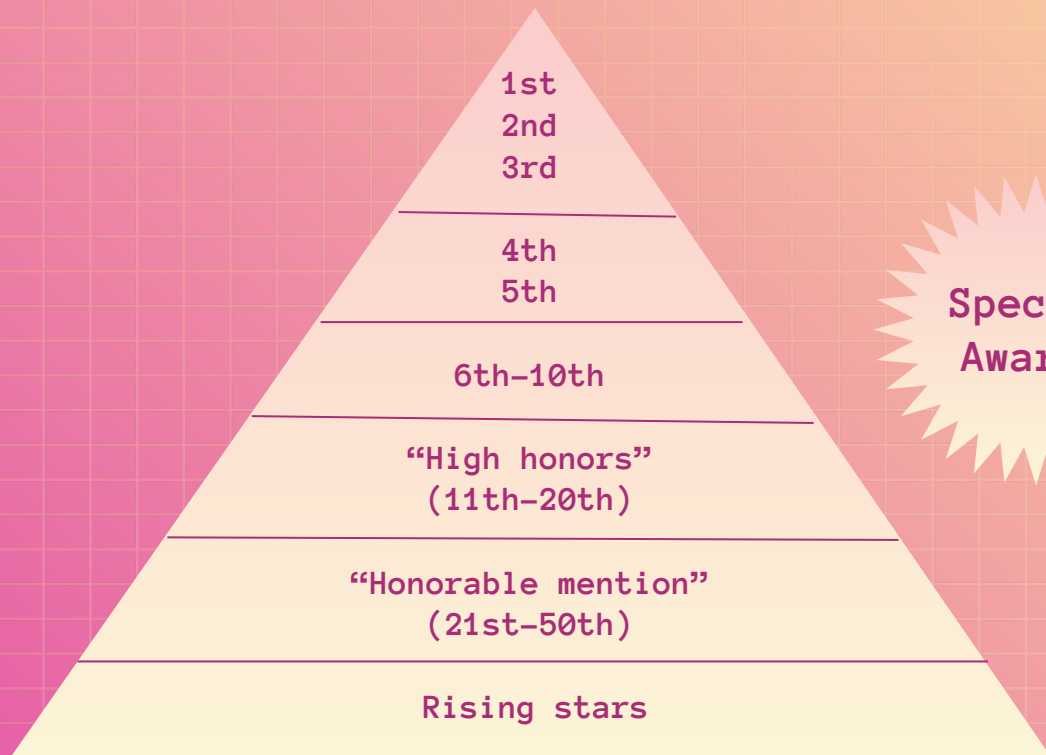
RISING STAR AWARD

- Three highest scoring 5th and 6th graders who were not in the top 50
- Girls who impressed judges by showing tremendous promise
- Prize: Swag bag + certificate

SWAG BAG (courtesy of HPE)

+ HPE T-shirt

RISING STAR AWARD

5th Grade

- Angelina Wan (CO)

- Aubrey Lindquist (CT)

- Jolene He (NY)

6th Grade

- Kaylee Jeon (FL)

- Ria Aggarwal (FL)

- Selena Ge (MA)

Honorable Mention

- Given to girls who scored in the top 50, impressing us with their passion and ability.

- Prize: Swag bag + certificate

CONGRATS

HONORABLE MENTION

2022 Math and AI 4 Girls Competition

This certificate is proudly presented to the top 50
scorers who demonstrated great passion
and ability in math and AI.

Natalie Shell

Natalie Anne Shell
President and Founder, Math and AI 4 Girls

Hewlett Packard
Enterprise

Issued on June 18, 2022

Honorable Mention

- Abby Kesmodel, CT, 7th grade
- Amber Zhou, NY, 7th grade
- Annabel Rong, GA, 7th grade
- Aparna Iyer, NJ, 8th grade
- Carolyn Cao, MD, 6th grade
- Cindy Wang, IL, 8th grade
- Eliana Wang, MD, 8th grade
- Erin Chen, IA, 7th grade
- Eva Koshy, IL, 7th grade
- Grace Jiao, AZ, 5th grade
- Jennifer Chen, CA, 8th grade
- Jiayu Su, CT, 6th grade
- Jiwoo Kim, NJ, 7th grade
- Kennedy Do, CT, 6th grade
- Lucy Sheng, CA, 8th grade

- Maggie Luo, CT, 5th grade
- Medha Thippireddy, NJ, 6th grade
- Melissa Yu, CA, 5th grade
- Rachel Du, VA, 8th grade
- Rebecca Jihyo Kim, NJ, 6th grade
- Sharada Suresh, NJ, 8th grade
- Sitong Wu, OR, 7th grade
- Sophia Lin, NY, 8th grade
- Suri Zhou, NJ, 5th grade
- Tiffany Tian, NJ, 7th grade
- Vaishnavi Mudumbi, NJ, 7th grade
- Valerie Fu, IN, 7th grade
- Vivian Lei, CA, 8th grade
- Cynthia Zhang, NY, 7th grade
- Yinuo Zhou, NJ, 6th grade

HIGH HONORS

- Girls placed between 11th and 20th
- Given to 10 girls who deeply inspired judges with their passion and ability
- Prize: $50 + swag bag + certificate

High Honors
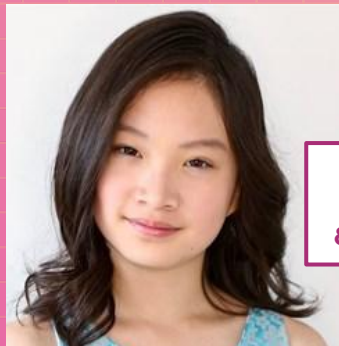
Alicia Li
NY
8th Grade

Audrey Wang
CA
8th Grade

Isabella Deng
CT
7th Grade

Olivia Ahn
CA
8th Grade

Ryka Chopra
CA
8th Grade

High Honors

Samhitha Kovi
GA
8th Grade
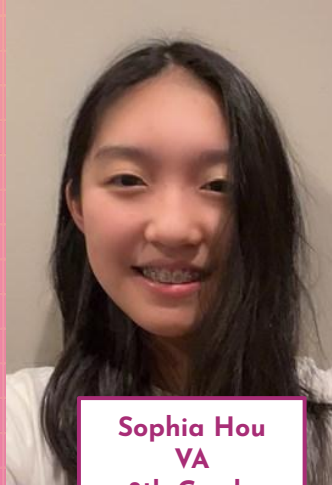
Sophia Hou
VA
8th Grade

Sophia Yan
MA
8th Grade

Tara Radoicic
NJ
6th Grade

Yutong Wang
NY
8th Grade

TOP 10

- Given to 10 girls who went truly above and beyond. These girls submitted clear and concise problem sets as well as essays expressing extraordinary accomplishments, vision, and leadership.
- First, we will announce 6th-10th, in alphabetical order.
- Prize: $100 + swag bag + certificate

Advika Asthana

6th Grade
Texas

Short biography

Advika (TX), is a Davidson Young Scholar, a published author, passionate about Math & Science. She loves to share her knowledge with others via various community services in and outside of school. She is an active media ambassador promoting STEM programs among girls. In her spare time, you can see her enjoying classical Indian dance (Kathak) and writing poetries.

Catherine Xu

**8th Grade
Iowa**

Short biography

Catherine is an 8th grader currently attending NWJH in Iowa. Starting in 3rd grade from Math Kangaroo and working her way up she is now a one-time JMO & MPfG qualifier, and a two-time AIME & Mathcounts Nationals qualifier. She placed 33rd at Nationals last year and received the Maryam Mirzakhani Certificate for the 2021 spring AMC 10A and the Maryam Mirzakhani Prize for the 2021 fall AMC 10A. When not doing math or coding, she can be found reading or outside.

Tina Gao

Short biography

Tina Gao lives in Birmingham, Alabama, and is in 8th grade. She is a Mathcounts Nationals qualifier, an AIME qualifier, a Mathleague Nationals qualifier, and on the AMC8 DHR. She wants to continue math competitions in high school, particularly the AMC10/AIME and ARML. Apart from math, she enjoys writing stories, playing tennis, and debating.

**8th Grade
Alabama**

Vaidehi Ramachandrula

8th Grade Wisconsin

Short biography

Vaidehi Ramachandrula is an 8th grader at Wisconsin Hills middle school who is fascinated with S.T.E.M. She loves learning different languages, and can fluently speak Telugu, and is currently learning Spanish and Sanskrit. Vaidehi loves physical activities. She is interested in Badminton, Taekwondo, and Yoga, and Indian classical dance (Bharatanatyam), which she has been learning for almost 10 years! In addition, she enjoys Science Bowl, FTC, and competitions such as Mathcounts and AMC's. In her free time, she loves programming and learning new things. Apart from that, she is also very adept in Carnatic Sangeetham(Indian Classical Singing). She is a frequent traveler and is very adventurous. She has done everything from riding on dolphins to jumping off cliffs. She has traveled 2 of the 7 wonders and plans to go to more of the 7 wonders.

Yunong Wu

**6th Grade
New York**

Short biography

Yunong Melody Wu is a 6th grade student in Rye Country Day School (RCDS). She loves robotics, programming and solving math problems. In 2019, Melody earned the Grand Honors, an award given to the top 3% students, from the Johns Hopkins University CTY program. In the AMC 8, Yunong advanced to both honor roll and achievement roll with a score 21/25. She is also the champion of the Math Olympiad and the NY Math League at RCDS. In her spare time, Melody plays piano and flute. She also plays soccer and ice hockey in travel teams. In the 2022-2023 season, her ice hockey travel team has advanced to AA-level.

4th & 5th Place:

- **$100**
- **A telescope**
- **A swag bag**
- **Certificate**

Telescope

5th. Adya Garg

Short biography

Adya is a 7th grader who loves to do math! She loves numbers and how they click together. In 6th grade, she led her FLL robotics team in robot building and programming, qualifying for Worlds in 6th grade. Adya has also earned Distinguished Honor Roll on the AMC8 and Achievement Roll on the AMC10. More recently, she won 1st place in the Thomas Jefferson Intermediate Math Open. In addition to math, she also plays the viola and occasionally codes.

7th Grade
Virginia

4th. Angie Huang

**8th Grade
Minnesota**

Short biography

Angie is very passionate about math. She is currently learning Calculus with the University of Minnesota. This year, she qualified for AIME and placed 5th in MathCOUNTS State. Aside from math, she enjoys playing piano competitively, and is a 2-time University of Northwestern Piano Competition finalist. She also enjoys writing, playing tennis, and watching football and basketball.

The Tenacity Award:

Given to the a student who discovered a mistake in the Math and AI 4 Girls official solution and reached out to us

(This contestant will receive an additional $100 cash prize and a special certificate)

The Tenacity Award:

Sophia Jin
8th Grade
Iowa

The Computation Award:

Given to the student to receive the highest score on the problem set, a 59.5 out of 60.

(This contestant will receive an additional $100 cash prize and a special certificate)

The Computation Award:

Catherine Xu
8th Grade
Iowa

The Computation Award

(Catherine's problem set):

5 Problem 5

Every second, an elevator either has 50% of going up of going down. If the elevator starts at floor 15, what is the probability that, after 5 seconds, the elevator is at floor 18?

5.1 Solution.

Answer: There is a $\frac{5}{32}$ probability that after 5 seconds the elevator is at floor 18

Notice that in order for the elevator to be at floor 18 after 5 seconds, within these 5 seconds, the elevator must have gone up 4 times and gone down exactly once.

There are $\binom{4+1}{1} = 5$ orders the elevator could've gone up 4 times and gone down once in. Each order has a $(50\%)^5 = \frac{1}{32}$ chance of happening, because there is a 50% chance the elevator goes up/down in a certain time slot as needed.

From this we get that we have a $5 \cdot \frac{1}{32}$ or a $\boxed{\frac{5}{32}}$ probability that the elevator is on floor 18 after 5 seconds.

12.1 Solution.

Answer: It takes 9 days to go from A to G and the optimal path is $ABCFG$

We're going to prove that this is the shortest path. Allow us to work backwards starting from G. Notice that first off, we cannot go from G to B to get the shortest path, because from G to B is already 9 days, making the entire path longer than our proposed optimal route!

So we test other routes from G. Notice that if we take the route to E from G, we have already used 7 of our 9 days from our proposed shortest route. All other paths leading away from E have 2 or more days and the one with exactly 2 days does not lead directly to A, meaning that all paths that start from G and lead to E require more than 9 days to get to A.

But what about the route from G leading to C? Notice that by going directly to C, we use 7 of our given days. From C we now have 3 options. By going straight to A, we require 16 days, which is not allowed. By taking the route from C to F, we use our remaining 2 days and are still not at A, so therefore the only remaining option is to go from C to B! However, it takes 1 day to get from C to B and there are no routes leading away from B that require 1 day or less, so therefore, we cannot go from F to C.

Now that we have that we must go from G to F we conclude that away from F are 3 routes. First note that we cannot take the route from F to E because that will use up 5 more days, leaving us at a place other than A and the path exceeding 9 days. So we consider the other two routes. By going from F to B, we use 4 more of our allotted days, leaving us with 1 day remaining out of the 9 to get to A. Again, there are no paths leading away from B that require less than 1 day, so therefore going from F to B is not the optimal option.

Therefore we must take the only path remaining, and go from F to C. From C we can either go to B or A, and seeing that the route directly to A takes up 9 days and would therefore lead to our path taking more than 9 days, we take the route to B. From B it becomes clear that our optimal route is to go directly to A, and thus we have proved that we can take a minimum of 9 days, and such optimal path is achieved by the path $ABCFG$.

10 Problem 10

The aliens that live on the distant planet of Zorblox use a different number base from us! In binary, or base 2, Ivy's favorite number is 11111100110. However, on Zorblox, her number is stored as 5616. What is Ivy's favorite number in base 10? What number base do the Zorbloxians use?

10.1 Solution.

Answer: Ivy's favorite number is 2022 in base 10 ands the Zorbloxians use base 7

In binary, 11111100110_2 is equivalent to

$$11111100110_2 = 2^1 + 2^2 + 2^5 + 2^6 + 2^7 + 2^8 + 2^9 + 2^{10} = 2022 \tag{21}$$

or 2022 in base 10. Therefore, Ivy's favorite number is 2022 in base 10. Let the base the Zorbloxians use be base z. 5616_z is equivalent to $5z^3 + 6z^2 + z + 6$, which is Ivy's favorite number, so from this we derive:

$$5z^3 + 6z^2 + z + 6 = 2022 \tag{22}$$

Knowing that z must be greater than 6 because 6 is used in the base z representation of 2022, bashing it out, we find that

$$5(7^3) + 6(7^2) + 7 + 6 = 2022 \tag{23}$$

So $z = 7$. Therefore, Ivy's favorite number in base 10 is 2022 and the Zorbloxians use base 7.

3rd Place:

- $300
- A telescope
- A swag bag
- Certificate

3. Sophia Jin

**8th Grade
Iowa**

Short biography

Sophia Jin is an 8th grader at Northwest Junior High School in Iowa. She is very passionate about STEM. This year she qualified for AIME, won 1st place in the MathLeague state competition, and won the State Science Olympiad competition. As an avid violinist, she plays with orchestras at Preucil School of Music and Iowa City West High School. She loves fencing and completes in various regional and national fencing competitions. Sophia is bilingual, reading classical Chinese poems and literature in her spare time.

Judges' Comments

Sophia had the highest essay score on this year's competition. In her 2nd essay, she carefully categorized key changes in technology. Her discussions of in-vitro meat, 3-D printing organs to prevent organ rejection, and quantum computing demonstrated genuine curiosity about the world and creative ideas grounded in a strong knowledge of current scientific achievements. The judges appreciated her passion, ability and ambition for the future.

2nd Place:

- $500
- A telescope
- A swag bag
- Certificate

2. Anika Rajaram

Short biography

Anika is an eighth grader whose interests are reading books, playing the violin, math competitions, coding and chess. She is among the top 3 girls in chess nationally in her age group. Anika recently qualified for the AIME and was a Project CSGirls finalist. She aims to pursue a career in astrophysics or robotics where she can combine her passion for math and coding. Anika's role model is Judit Polgar, a trailblazer in chess, the only woman ever to rank in the top 10 players.

Judges' Comments

As one of last year's top 10 contestants, Anika has returned with yet another exceptionally strong entry, earning one of the highest problem set scores. In addition to qualifying for AIME and being one of the top chess players nationally, Anika also coaches a local math team. Her 'Technology in 2050 essay' was vivid and well-written, and her attention to detail was evident in her creative naming of new technologies.

8th Grade
California

1st Place Winner:

- $1,000
- A telescope
- A swag bag
- Certificate

1. Adrita Samanta

Short biography

Adrita (8th grader) is very passionate about math, robotics, and computer programming. She is a USAJMO and USACO Gold qualifier. She volunteers as a TA in robotics and programming classes in local public schools. In her free time, Adrita loves to play tennis, paint, dance, and play the violin.

Judges' Comments

Adrita scored exceptionally well on the problem set, receiving the a near-perfect score. Additionally, her experiences as a TA, a research intern, and a USACO Gold / USAJMO contestant were extremely impressive. In her essays, Adrita expressed a clear passion, aiming to be at the forefront of the development of technology in 2050; her leadership and ambition truly set her apart.

**8th Grade
Massachusetts**

Special Thanks

Guest speaker: Dr. Jamie Wells
Judges: Dr. Arti Garg, Anjana Prabhakar

HPE: Antonio Neri, Keisha Givens, Anre Niehaus, Aisha Washington, Tally Tiesing
Automation Anywhere: Neeti Mehta Shukla
JP Morgan Chase: Dr. Manuela Veloso, Sebastian Gutierrez
D.E. Shaw: Maja Hazell, Cindy Tran

Additional thanks to: Dan Plotnick (Bergen County Math), Xavier Guzman (All Saints Catholic School), Sonalee Parekh

Great Job, Team

Closing
Thank you for coming!!!

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mathandaiforgirls@yahoo.com