THE 2025 YOUNG MATHEMATICAL STORY AUTHORS (YMSA) COMPETITION

THE STUART J. MURPHY AWARD
(THE 8-11 YEARS OLD CATEGORY)

LONGLISTED

‘Area of Zadia’

by Arhan Shah (11 years old)
at PEP School v2 (India)

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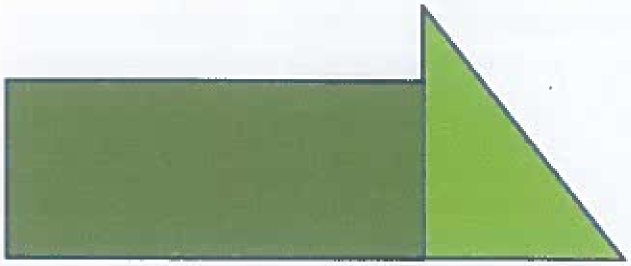
Area of Zadia



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Chapter 1: The Battle for Zadia

Boom! Boom! Boom!

The sound of war echoed through the land. In the evergreen kingdom of Zadia, a terrible war raged on. This war was fought between two princes of Zadia, who just so happened to be brothers.

The two princes were fighting over the kingdom itself! When their father passed away, the princes were supposed to share Zadia, but Jack, being the older brother, got more land. Since Jack got more, Zack, the younger brother, became angry and declared war on Jack's part of Zadia.

This war was disastrous, and Zadia suffered a great loss in population.

Zack wanted only one thing to end the war: half of Zadia's land. But when he asked Jack for his share, his brother agreed... but they just couldn't figure out how to split the land in half! The brothers needed a solution.

Could math save Zadia from total destruction?

Chapter 2: The Math of Division

The two princes, Jack and Zack, decided to visit Aryabhata, a famous mathematician known for solving problems across many kingdoms. They met him in Zadia's finest café and explained their dilemma.

"We need to split Zadia in half, but we don't know how," Jack said. "I have more land, and Zack wants half. How can we divide it fairly?"

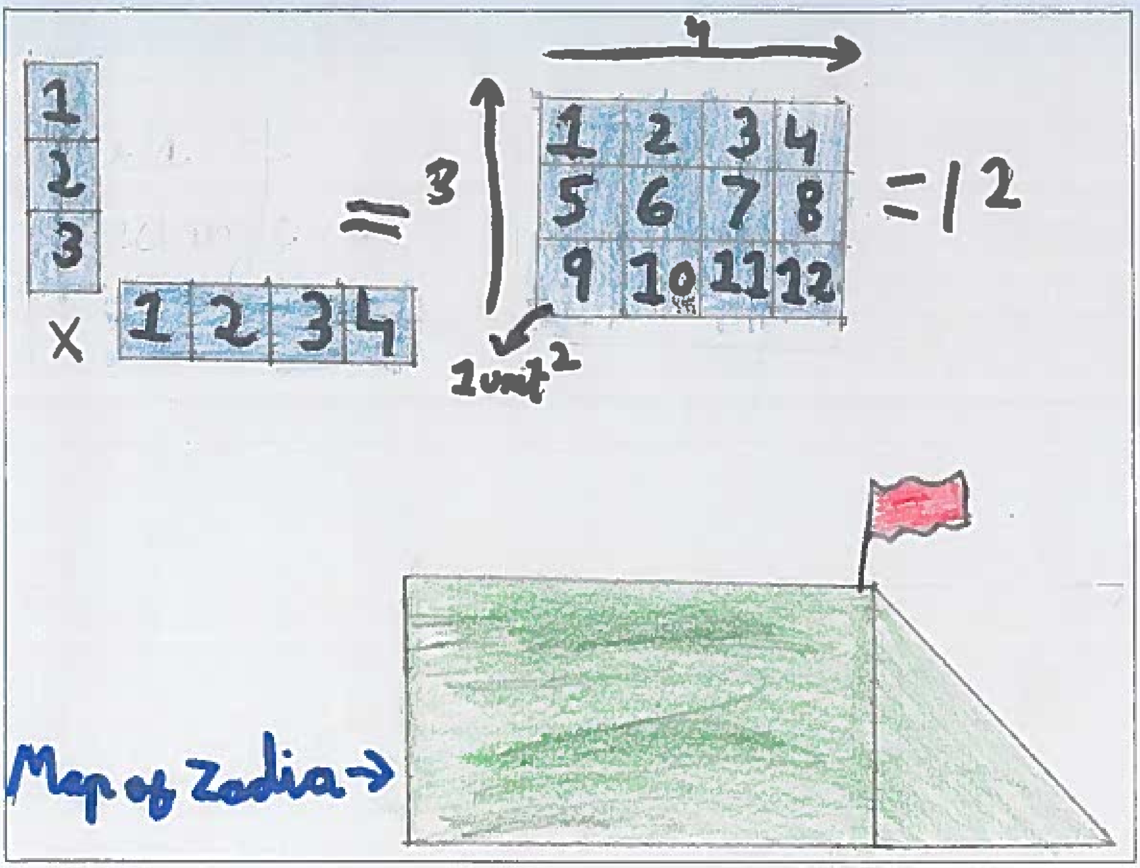
Aryabhata listened carefully and then said, "The answer is simple—it just needs area."

"What is area?" both princes asked at the same time.

Aryabhata smiled. "Area is the space inside a shape. It's a formula, like a trick to measure the size. For example, a small circle can have the same area as a large triangle. If I know the shape of your land, I can use the formula for that shape."

"Our land is rectangular," Zack replied.

"Perfect!" Aryabhata said. "Let's work with that.



To find area of any shape we first divide it into smaller parts of 1 unit each. Like in case of Zadia the land is in shape of a rectangle and we can split it into smaller parts. Divide it horizontally into 3 parts and vertically into 4 parts to create squares of 1 unit. You then count how many squares are there. In this case, 3 x 4 equals 12 squares. This gives you the total area of any rectangle.

If you have the measurements of length and breadth of your land, just multiply the length and breadth. That's the formula for the area of rectangle land.

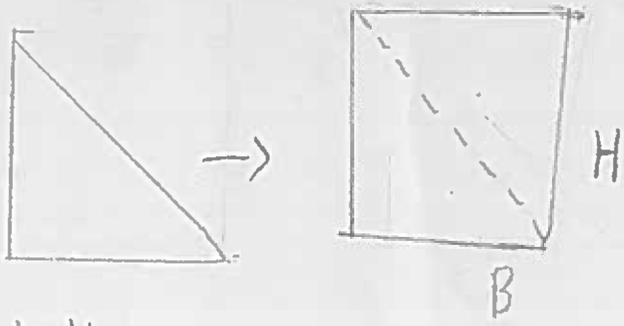
"Did you understand?" Aryabhata asked.

"Yes!" both brothers answered.

Aryabhata continued, "Now, your rectangle land is 700 kilometres long and 1,000 kilometres wide. So, the area is 700 x 1,000 = 700,000 square kilometres. To split it in half, each of you would get 350,000 square kilometres."

"So what about other shapes", asked Zack. "Oh Yes! Zadia also captured another territory which is in shape of a triangle". Jack exclaimed with excitement trying to understand the concept of Area more!!

Chapter 3: Breaking Down the Triangle



$B \times H = 2$ triangle.

$\frac{B \times H}{2} = 1$ triangle.

Aryabhata smiled at Jack's curiosity. "Ah, triangles are a bit different, but not too hard once you understand the basics. Imagine you have a triangle that's part of your land. You can't just divide it into squares like we did with the rectangle. But what you can do is use a different approach."

He drew a large triangle in the air with his finger. "Let's say this triangle has a base at the bottom and a height that goes up from the middle of the base to the top. Now, to find the area of this triangle, we use a simple formula: **Area = 1/2 × base × height.**"

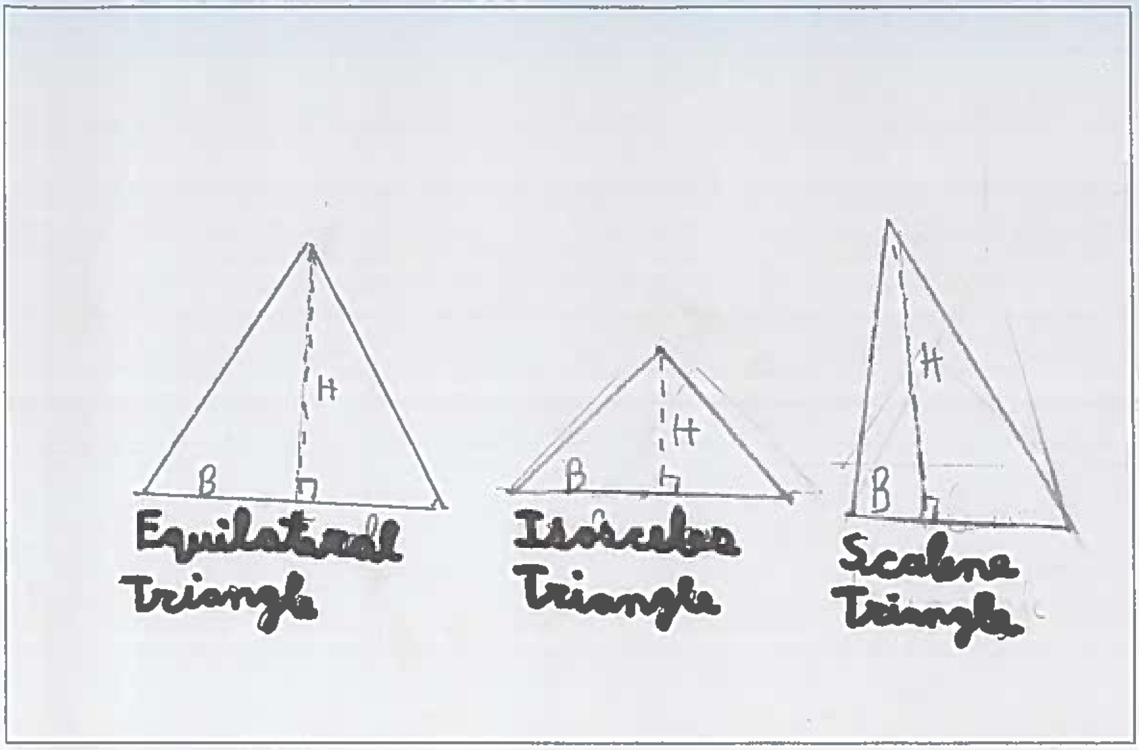
Zack scratched his head. "But why do we divide by 2?"

Aryabhata nodded, impressed by the question. "Good question! You see, if you were to draw a rectangle around the triangle, the area of the rectangle would be base × height. But a triangle only takes up half of that space. So, we divide by 2 to find the area of just the triangle."

Jack, eager to learn, quickly added, "So if the triangle has a base of 400 kilometres and a height of 300 kilometres, the area would be..."

Aryabhata smiled and nodded. "Exactly! The area would be **1/2 × 400 × 300 = 60,000 square kilometres.**"

"So, if I wanted to split the triangle in half for both of you," said Aryabhata, "you would each get **30,000 square kilometres** of land from the triangle."



Zack grinned. "That's really cool. But what if the triangle isn't right in shape? What if it's a little more skewed?"

Aryabhata paused and thought for a moment. "That's a great point. If the triangle is not a right triangle, we still use the same formula for **base × height**, but the height might not be as obvious. It could be the distance from the highest point to the base, which sometimes you have to measure carefully. If it's not clear, you may need to draw some extra lines to help determine the height."

Jack was nodding, his eyes wide with understanding. "So, I just need to find the base and height, and then apply the formula. But what if I'm unsure of the height?"

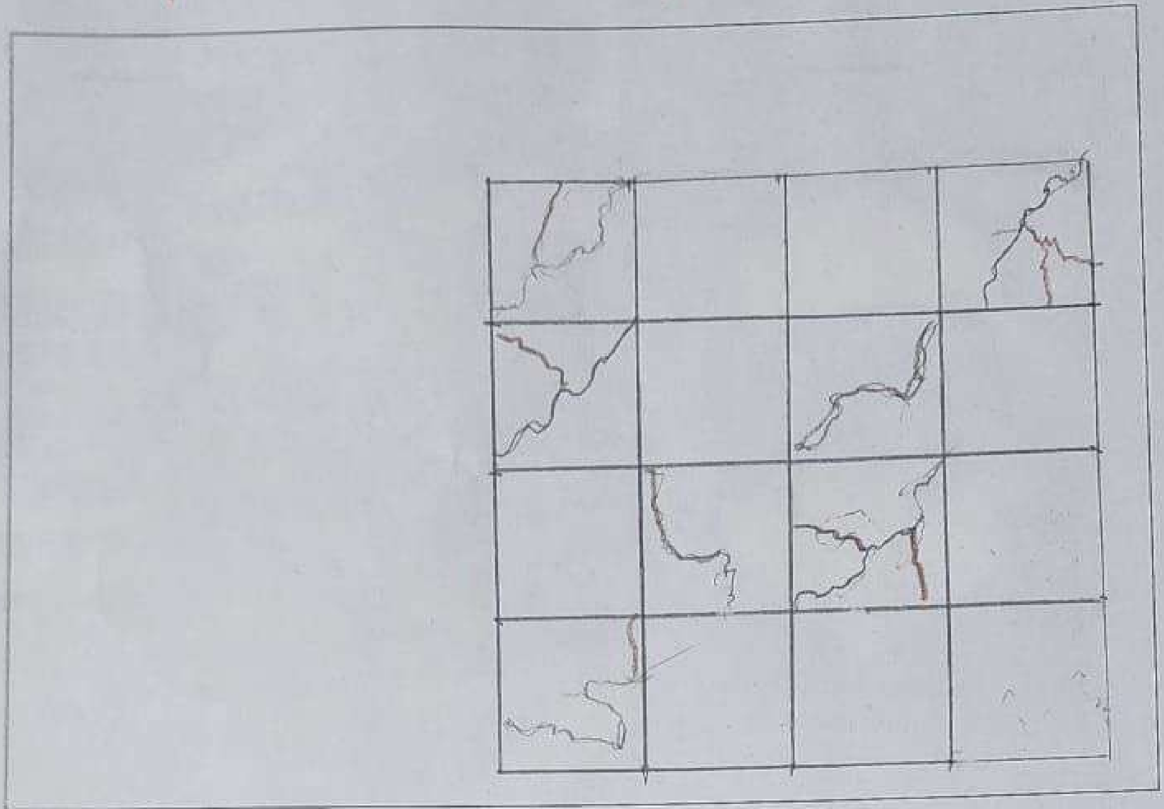
"Well," Aryabhata said, "there are other methods, but that would be the easiest for now. If you have a more complex triangle, you could break it into smaller shapes, just like we did with the rectangle. You could also use something called Heron's formula, but that's a bit more advanced. For now, focus on the basic idea."

Zack looked at his brother. "I think I get it now! So, the area of a triangle is also about dividing it into smaller parts and using the right formula to find the total area. It's like solving a puzzle!"

Aryabhata laughed. "Exactly! And once you understand how to find the area of different shapes, you can apply that knowledge to all kinds of land problems, whether you're a prince, a farmer, or an explorer."

The princes marvelled at the new found knowledge of area and enormity of the land they would each receive. "Now we know how to divide it fairly," Jack said, smiling. "Thanks to you, Aryabhata."

Chapter 4 : The Square Solution



Zack lets celebrate this by having a grand feast at my place but I will need some time so meet me at my place in one month I will call Aryabhata now to tell him he is invited too." after Jack went home, he noticed a big problem in the room where the grand feast was supposed to happen the tiles were cracked. Jack immediately called the mason but the mason said "I need the area of the room so I can get that much marble to make the tiles. He called Aryabhata to explain him what the area of a square is and how to solve his problem. Once Aryabhata came Jack again explained his problem. Aryabhata said you need the area of a square. A square is like a type of rectangle wherein length is same as breadth. so we can use the exact same formula that we use to measure the area of a rectangle. Length x breadth but as we know length and breadth of a square are same so it can be written as length x length. Or $(\text{length})^2$. Since the length of your room is 100 feet you have to do 100 x 100 = 10000 square feet.

After a few days the room was done and ready for the grand feast. Jack eagerly waited for the day of the feast. Finally, the day came and everybody from both the kingdoms and Aryabhata arrived. The feast was very good and the war was done. It was all thanks to Aryabhata and his knowledge of geometry and how to find areas of different shapes.

Blurb

In the kingdom of Zadia, a fierce war rages between two brothers, Princes Jack and Zack, over the rightful share of their land. When the land becomes too divided and the destruction too great, the princes turn to Aryabhata, a renowned mathematician, to solve their problem.

With Aryabhata's teachings on the power of geometry, the brothers learn how to divide Zadia fairly using the principles of area. But when an unexpected problem arises—cracked tiles in the room where the grand feast is to be held—Aryabhata's wisdom once again saves the day. T

he Battle for Zadia is a story of conflict, learning, and the surprising ways math can change the course of history.?

About the Author

I'm Arhan Shah, and I've always had a deep love for reading books and learning new things. From my early years in Montessori school, I developed a curiosity about the world that has stayed with me ever since. I also love playing cricket, swimming, and badminton, which keep me active and help fuel my creativity. Writing is a way for me to share the stories and ideas that inspire me, and I hope to encourage others to explore the world through books and imagination. For me, writing is not just about telling stories, but about sparking curiosity and a love for learning in others.