

INTEGRATING COMICS INTO THE COMMON CORE STATE STANDARDS

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SOLUTION SQUAD #1

This is my educational comic, Solution Squad. It is a 24-page comic book story followed by eight pages of origin stories written in text form. The characters are teenage heroes with powers based on mathematical concepts! I use this comic to teach middle school math! It was written, laid out and lettered by me, with interior art by my very talented 24-year old niece, Rose McClain.



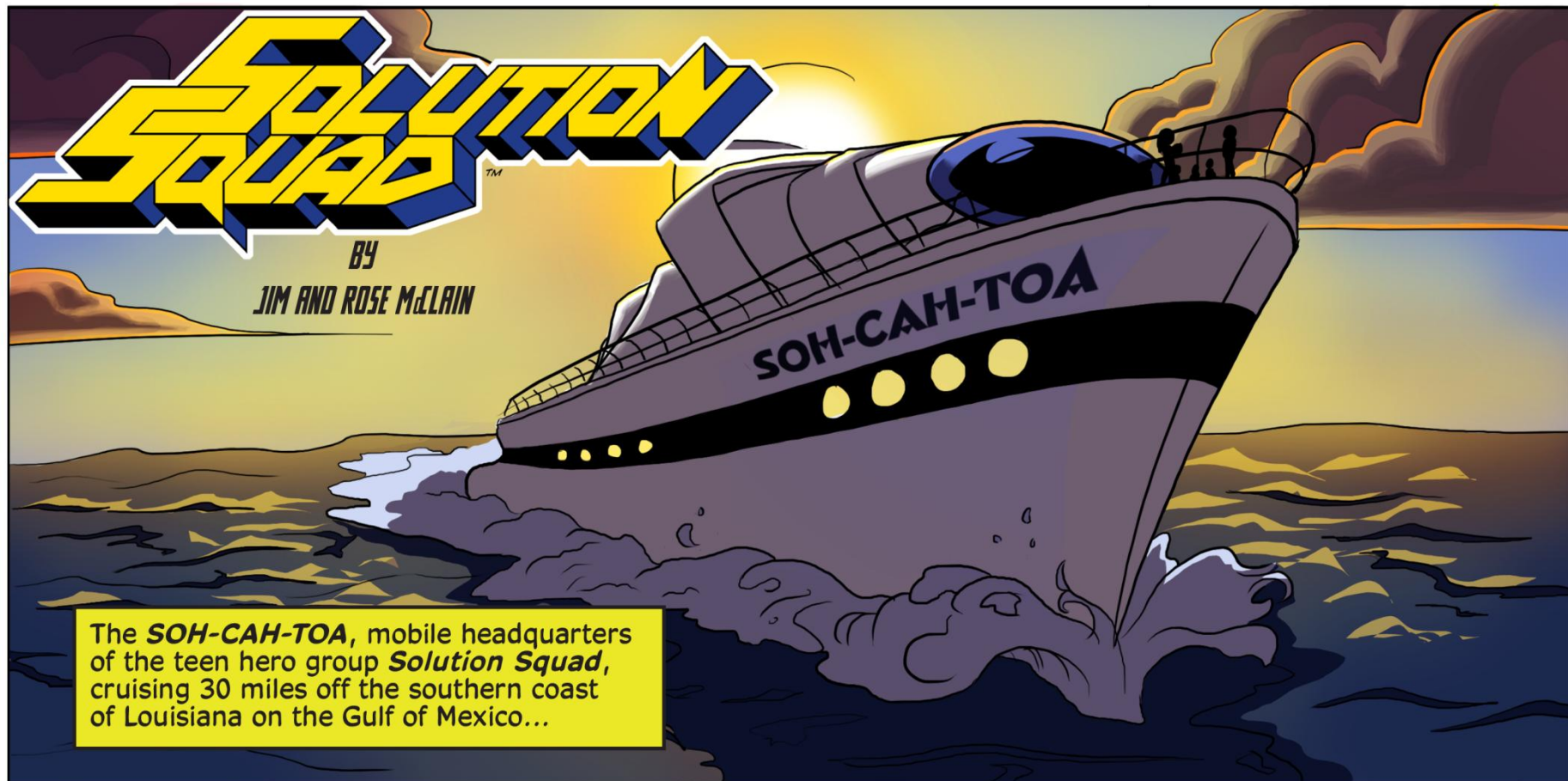
THE HANDSHAKE PROBLEM

***EMBEDDED WITHIN THE
FIRST FOUR PAGES OF
SOLUTION SQUAD #1***

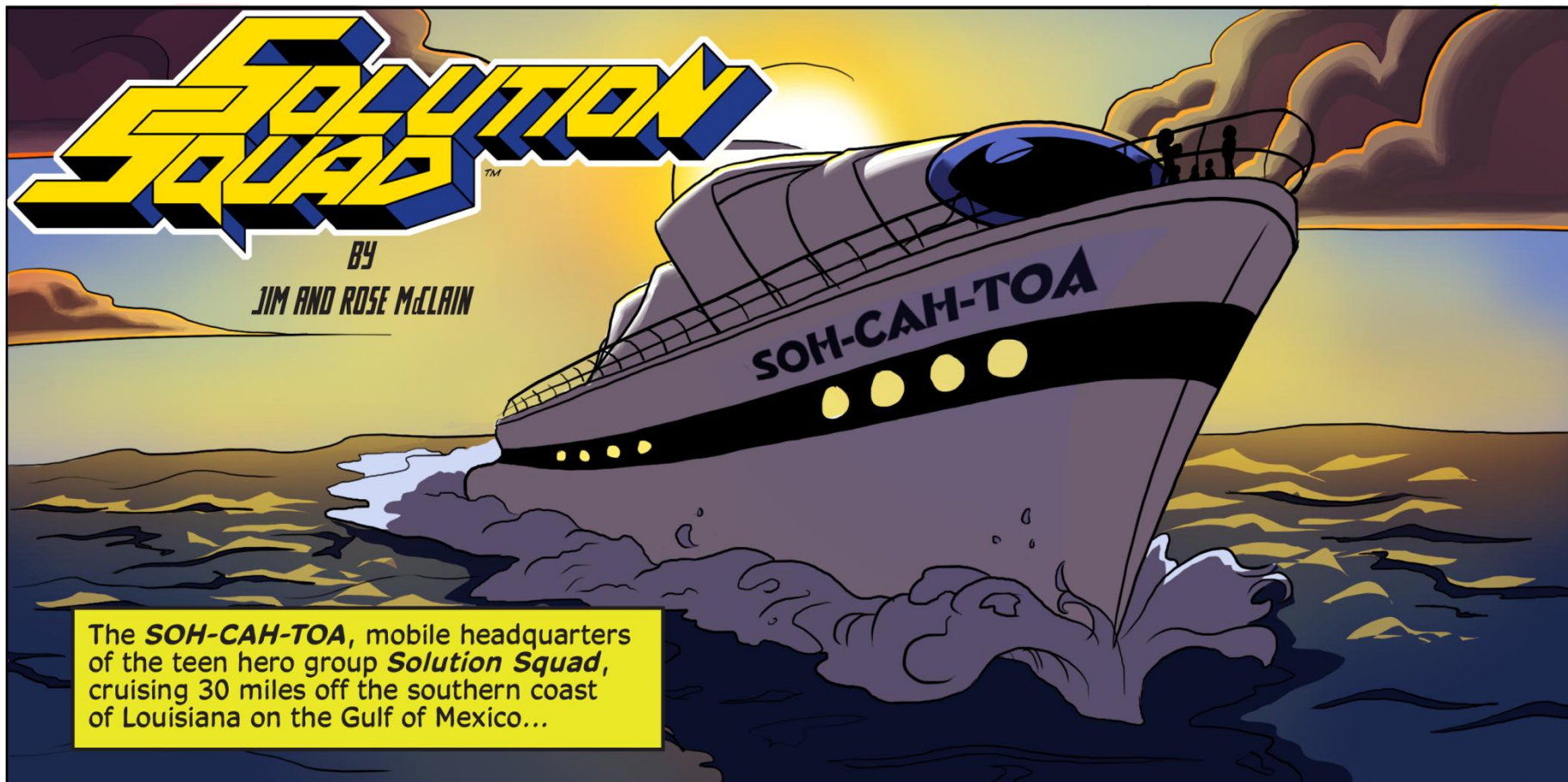


SOLUTION SQUAD

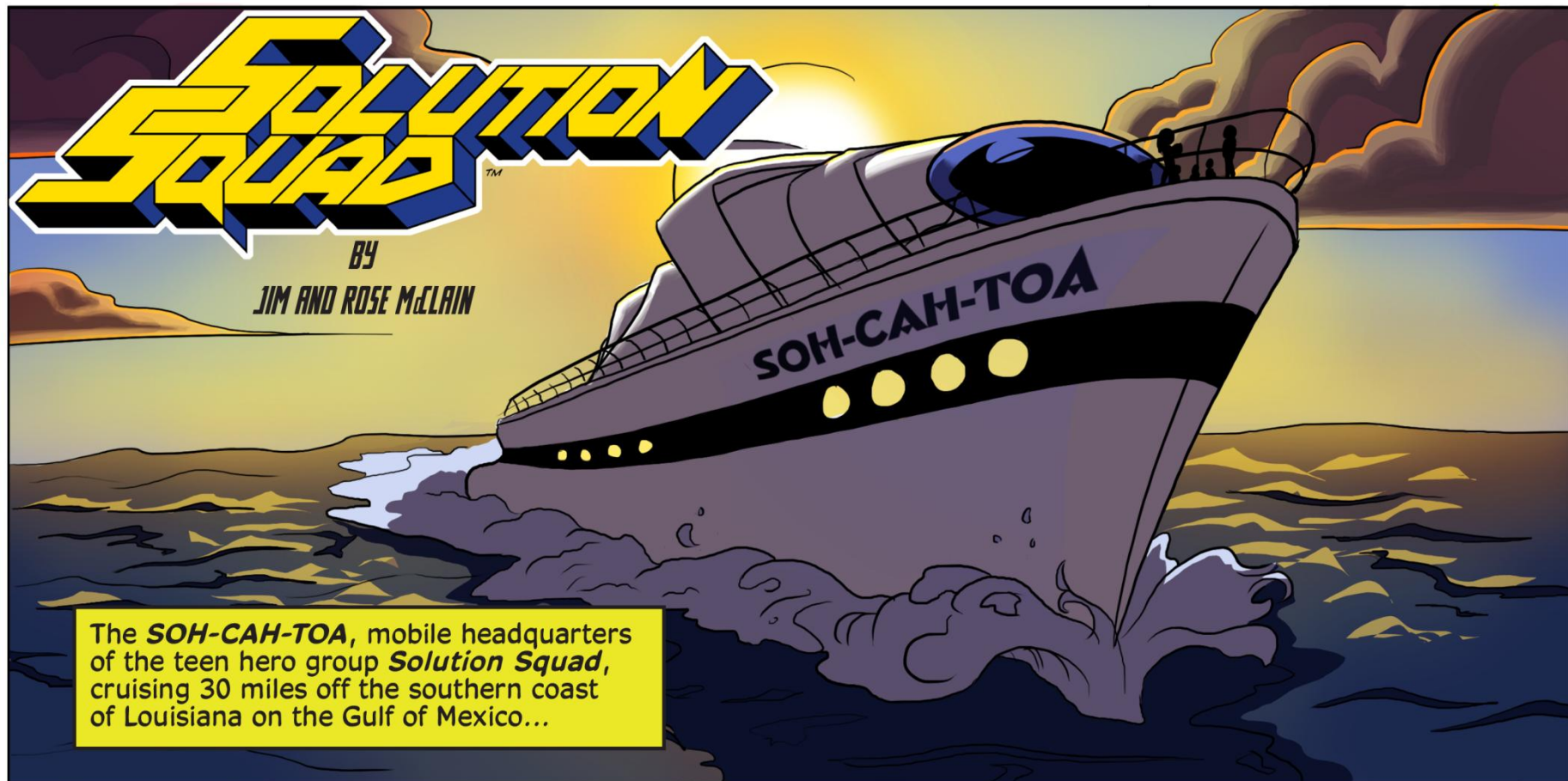
BY
JIM AND ROSE McCLAIN



The **SOH-CAH-TOA**, mobile headquarters of the teen hero group **Solution Squad**, cruising 30 miles off the southern coast of Louisiana on the Gulf of Mexico...



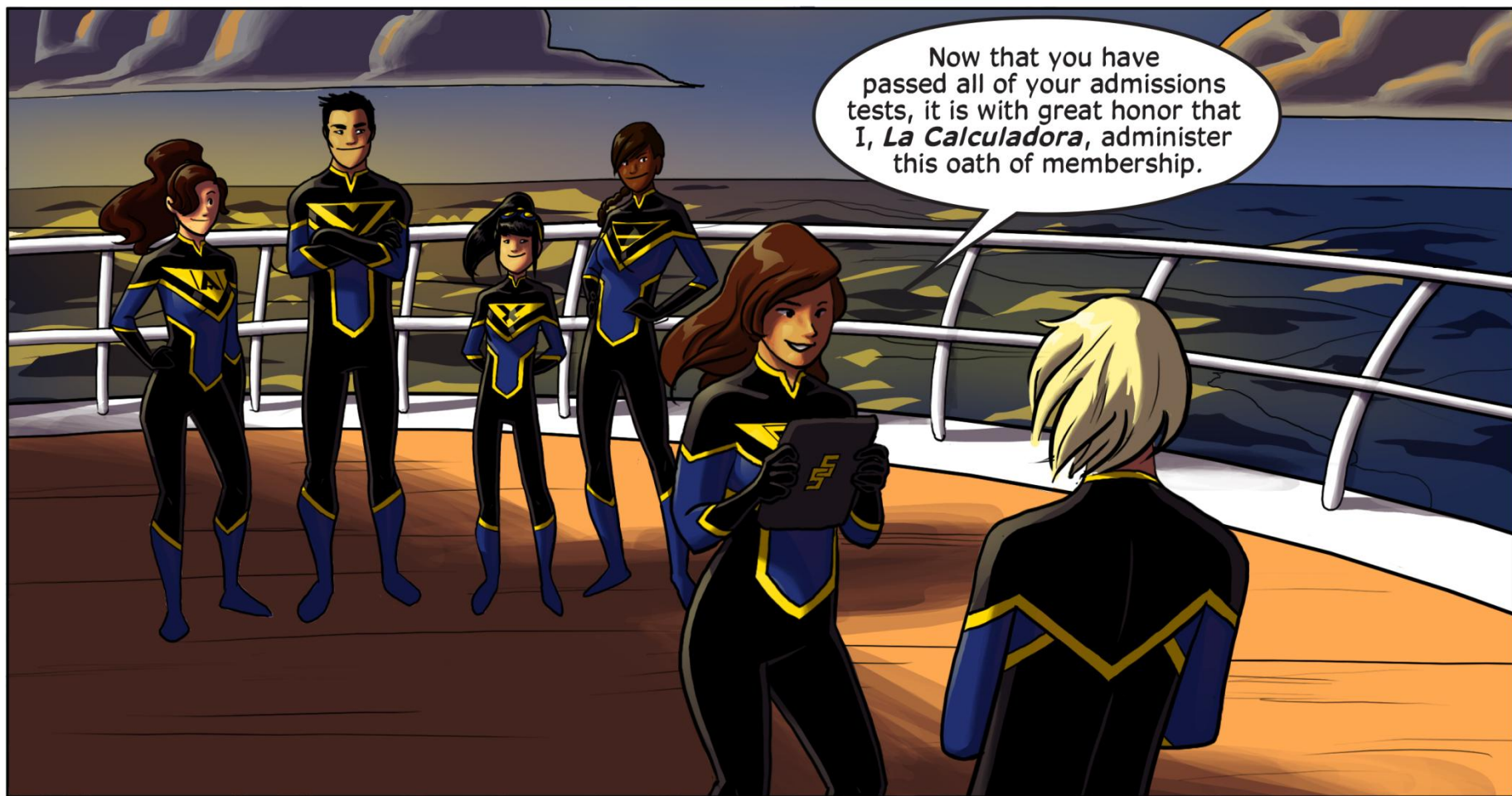
Does the name of the yacht look familiar?



It's a mnemonic device for memorizing trigonometric ratios!

We meet our heroes during an initiation ceremony...





Though we don't wear masks,
we do use **code-names**. We put a lot
of thought into yours. With your style
and powers, the only name that
fits you is...

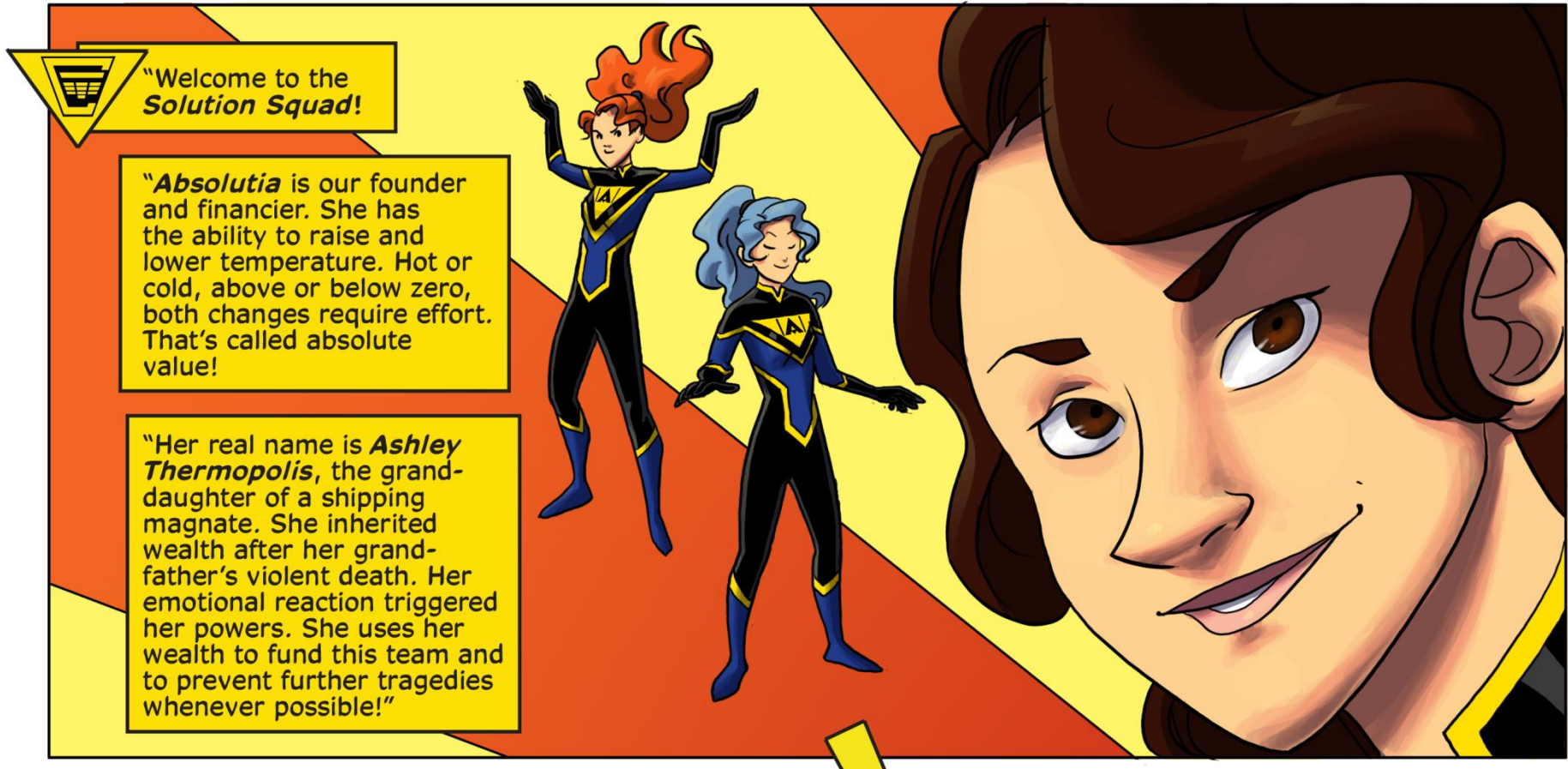




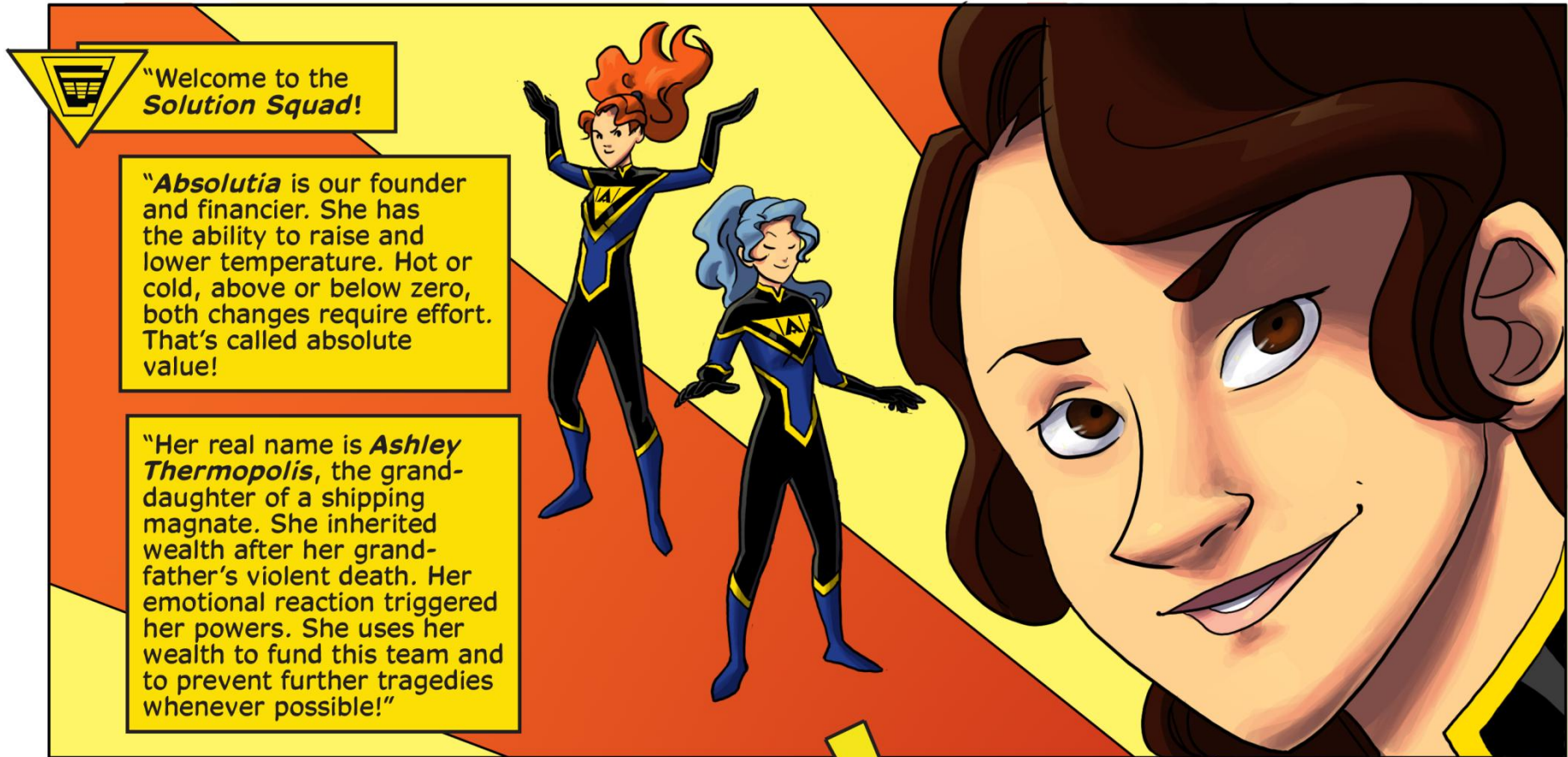


Notice that Radical's symbol resembles a lower case r. This helps kids remember what the symbol is called!

Now, one at a time, we are introduced to the six main characters!

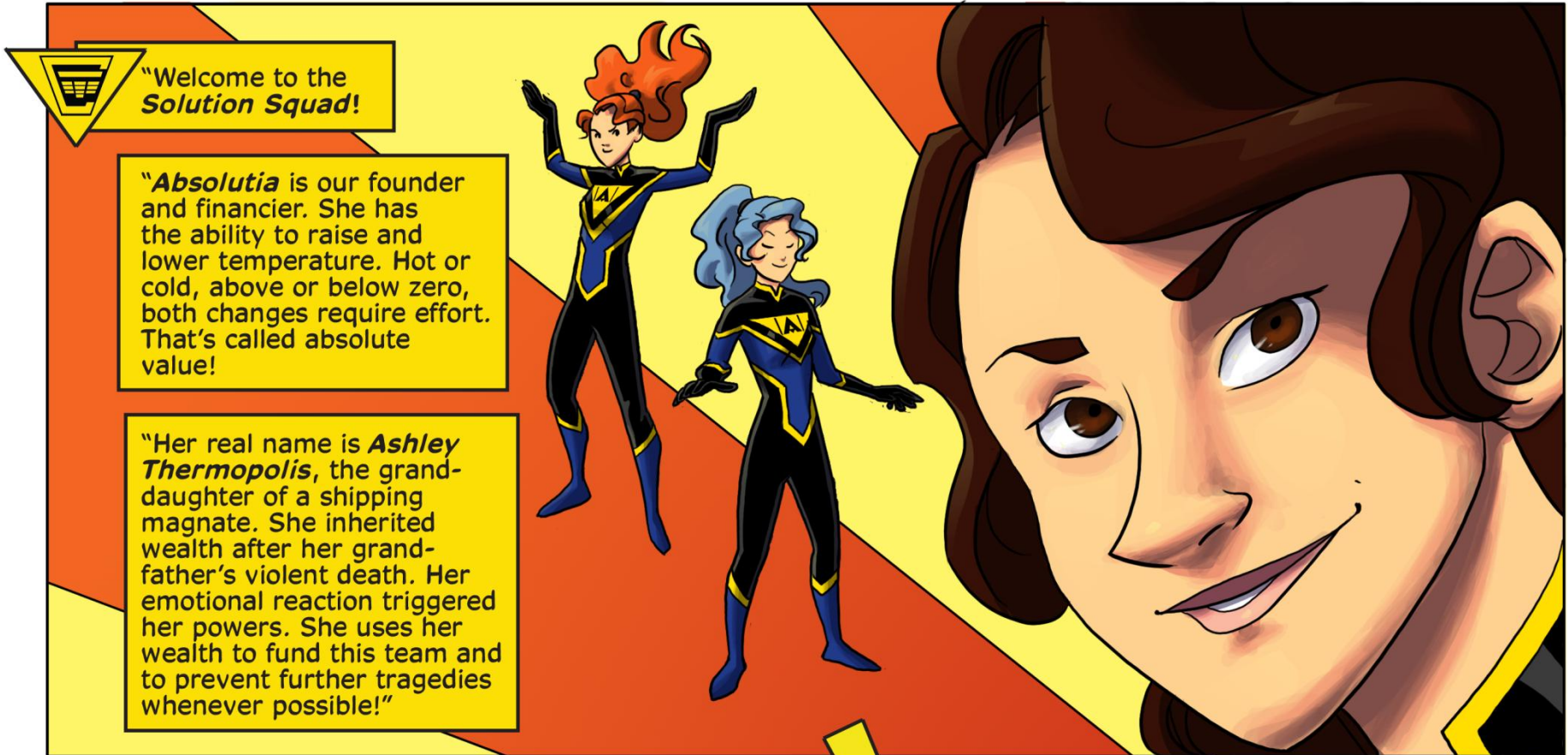


Now, one at a time, we are introduced to the six main characters!



And the Common Core standards I teach with them:
6.NS.5, 6.NS.6, 6.NS.7, 7.NS.1, 7.NS.2, 7.NS.3

When Absolutia raises the temperature, she raises her hands and her hair and eyes turn red. When she lowers the temperature, she lowers her hands and her hair and eyes turn blue.



I get a kick out of watching my kids, hunched over their work, raising and lowering their hands like she does!



"My story isn't sad at all. As plain old **Dora Pérez**, I've always been fast at computation. Then I started to develop other talents as my brain began to make connections between mathematical concepts.

"I was able to use those talents to raise my family up out of poverty in Mexico. My story drew the attention of Absolutia, and the next thing I knew, she was calling me **La Calculadora**, leader of the Solution Squad!

"My talents include a perfect memory, hyper-acute senses, and a knack for languages, invention, design, cooking, art...just about anything!"

With La Calculadora (the Calculator), there are simply too many standards to list! She handles anything using computation!



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I really emphasize mental math in my class. I don't allow calculator usage unless it's in a student's IEP. La Calculadora shares her tricks with students on how to do as much as they can without one.

"**Equality** is perhaps our most powerful teammate. She can do anything anyone else can do at exactly the same level, but she can only duplicate one person at a time.

"A three-sport athlete before she discovered her powers, **Hannah Harrah** is also our physical trainer. Her self-discipline is second to none.

"Equality's father, Otto Harrah, is the chief of police in **Crescent City**, and it's under his watchful eye that we are allowed to operate as heroes."



Again, there are way too many standards to list for Equality! Anything to do with equations or equivalency is introduced by her, all the way down to reducing fractions!

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Take a look at her real name. Notice that it is made up of palindromes? Her father's name is, too. If you check the back of the comic, her whole family is the same way!



"Then there's the **Ordered Pair**: Twins orphaned as toddlers in China who were adopted and raised separately by American parents. They each grew up knowing that the other was out there, somewhere. When they met, their powers were triggered.

"**Abscissa**, whose real name is **Xiao Sheng Mercer**, can move at incredible velocities along any horizontal surface. She doesn't run up the sides of buildings..."



Abscissa (the seldom-used term for the x-coordinate in an ordered pair) is based on my daughter, who we adopted from China. Her Chinese name really is Xiao Sheng. She thinks it's the greatest thing in the world to be a superhero in Daddy's comic book! The y-value is called the ordinate, so...



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"...but her twin, **Ordinate**, who is younger by minutes, can fly to the highest heights, and dive to the deepest depths.

"**Yao Feng Cheung** can withstand those extremes, which makes him really strong and tough. He also has an array of senses that allows him to thrive in those environments.

"**Ordinate** is fiercely loyal. Where his sister **Abscissa** leads, he will always follow. Separately, they are formidable. Together, they make a nearly unbeatable team."

My daughter doesn't really have a twin brother. She wishes she did, though.

ABSCISSA AND ORDINATE'S STANDARDS:

5.OA.3, 5.G.1, 5.G.2, 6.NS.6, 6.NS.8, 6.RP.3, 6.G.3 and any other standard that goes with graphing on the coordinate plane.

My favorite character is Radical. He's a time traveler from when I was much younger who gives me the excuse to use outdated slang. The other kids never use slang of any kind, but Radical makes up for it!




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He's the comic relief. The prototypical slacker, Radical provides a sounding board when exposition is needed to explain a concept explicitly.



Radical is my go-to guy for the Pythagorean Theorem. Though they're all 8th grade standards, they're still on my 7th grade standardized test:
8.EE.1, 8.EE.2, 8.G.6, 8.G.7, 8.G.8



Do you swear
to uphold justice and
preserve order according to
our by-laws and further
promise to *never* take
a human life?

Dude--
I mean, *Dora*--
I so *totally*
do!

Then by the
power invested in me as
team leader, I hearby grant you
full membership in the
Solution Squad!

And here comes the trap. Are you ready?



**DEFENDIT
NUMERUS!***

*Pronounced dee-FEND-it NEW-mer-us,
from the Latin, "There is safety in numbers!"

“THE HANDSHAKE PROBLEM”

There are now six members of the Solution Squad. If each of them shakes hands with each other, how many different handshakes will occur?

Note: La Calculadora shaking hands with Radical is the same handshake as Radical shaking hands with her.

“THE HANDSHAKE PROBLEM”

That’s the guided practice section of the activity. Here comes the independent practice:

“THE HANDSHAKE PROBLEM”

ASSIGNMENT

If the Solution Squad expanded its membership to the number of students in this room right now, how many different handshakes would occur (La Calculadora shaking hands with Radical is still the same handshake as Radical shaking hands with her)? What if the team had 100 members?

SHOW ALL WORK!

“THE HANDSHAKE PROBLEM”

COMMON CORE STATE STANDARDS

6.EE.A: Apply and extend previous understandings of arithmetic to algebraic expressions.

CCSS.Math.Practice.MP4: Model with mathematics.

CCSS.Math.Practice.MP8: Look for and express regularity in repeated reasoning.

BEYOND THE STANDARDS

The Handshake Problem isn't even what the main story in Solution Squad #1 is about! The main story is about the team falling into a trap that they have to escape by developing a prime number code to defuse a bomb! The Handshake Problem is incidental. There are several kinds of problems embedded within the comic. There are scientific notation and distance/rate/time problems, percent change, graphing, Pythagorean Theorem problems—I hid all kinds of stuff in there!

BEYOND THE STANDARDS

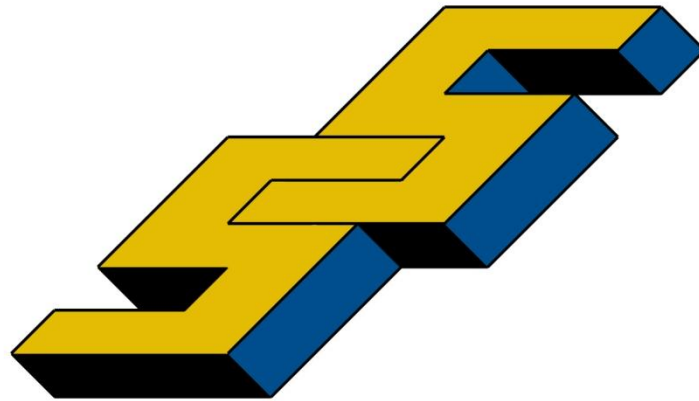
The Origins section, with its text pages (it contains over **5,000** words, by the way) gives the height and weight for each character. It's a database that you can use to convert measures, find mean, median, mode, and range, even to solve proportion problems—these are all coming soon, don't worry! And if I don't publish them fast enough, you can make them yourself!

BEYOND THE STANDARDS

- Comics are fun and they can make math fun, too!
- My students LOVE these characters.
- Vocabulary is everywhere!
- The terms are easy to remember when they belong to a memorable character.
- And their "S.S." symbol, which has been in the background the whole time, can be graphed, and it even tessellates.

BEYOND THE STANDARDS

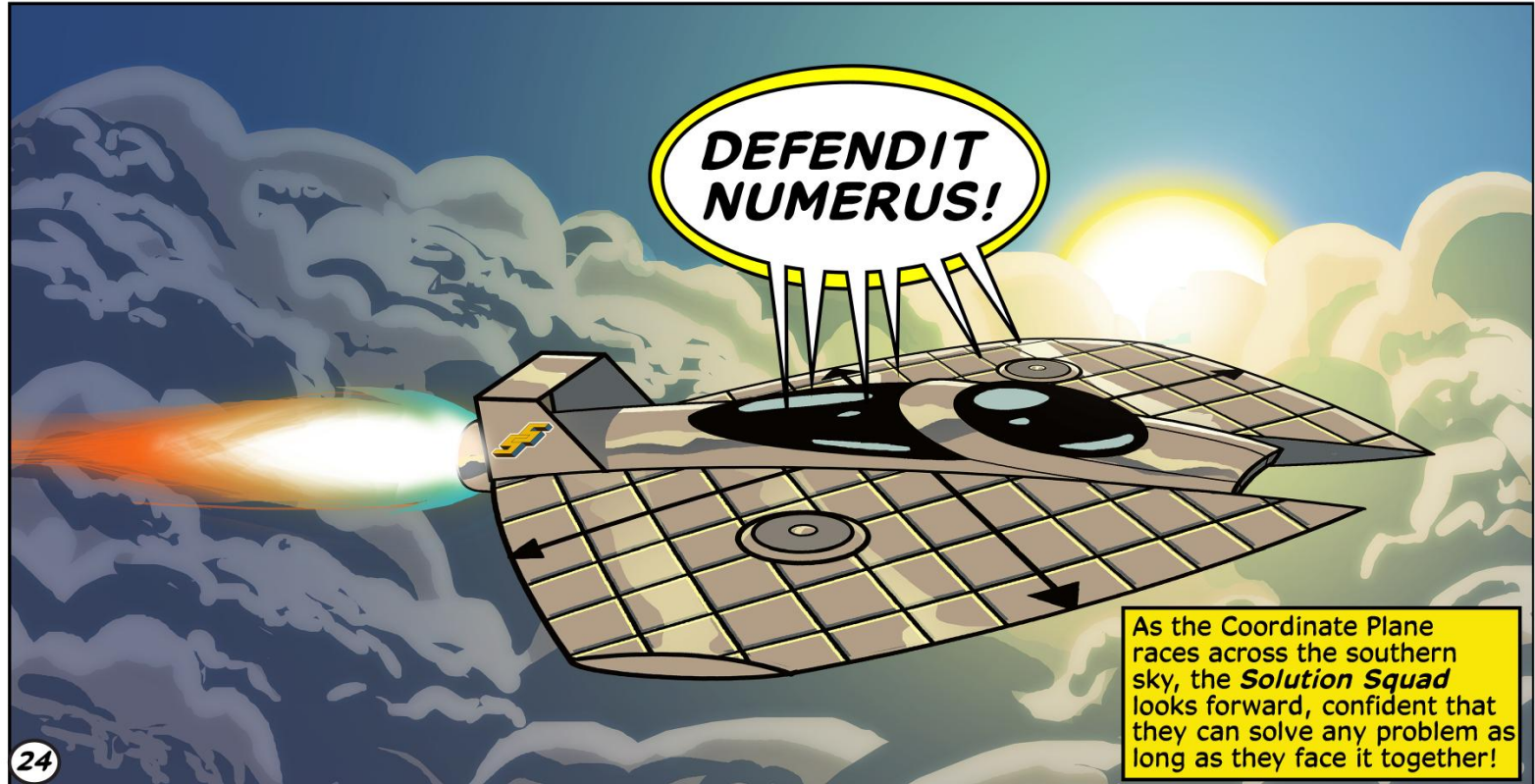
See?



BEYOND THE STANDARDS

And last, but not least, it should be pointed out that the Solution Squad flies around in...

THE COORDINATE PLANE



I'll let you do the math on that one!

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BE PART OF THE SOLUTION!