True Tales of Algebra

By Deb Kollars Bee Staff Writer (Published Dec. 11, 2000)

Brian White hated it. It made Julie Beall cry. Tim Broneck got an F-minus. Tina Casale failed seven times. And Mollie Burrows just never saw the point. This is not a collection of wayward students, of unproductive losers in life.

They are regular people from the Sacramento region, with jobs and families, hobbies and homes. And a common nightmare in their past. "My husband once tried to tutor me. That was the fifth time I failed algebra. I would erase the problems so many times you could see through the paper," said Casale, an Elk Grove writer and mother of two. "It's the reason I can't get a college degree." "It just blew me away. It was so intimidating," said White, a businessman from Antelope. "I basically hated every minute of it."

With algebra, there are many truisms to ponder and learn: a plus b equals b plus a; if you subtract a quantity from one side of an equation, you must do the same to the other side; to multiply numbers with exponents, you add the exponents when the bases are the same.

Then there is the most dependable maxim of all: Algebra equals pain. It is happening now for Heather Holder, a freshman at Hiram Johnson High School in Sacramento. Heather is among the first crop of high school students in California who must complete Algebra 1 to graduate. The new statewide graduation requirement, approved by the governor this fall, takes effect with the graduating class of 2004.

Heather has reached the point in school that arrives for many students: Her parents can no longer help her with math homework. "It looks like Chinese to me," her mother said. The result: Heather is on her own. Some days, it is rocky going. On a recent Wednesday, Heather came to class with just two of the 30 homework problems completed.

"Any questions on the homework?" asked her teacher, Michael Duggins. Heather's hand went up. Duggins: "Which number, young lady?" A sigh
from her seat: "Just about all of 'em." "OK, here we go," Duggins said as he stepped to the board and wrote the first one: \(-21 = p - 13\).

The ultimate goal, he told the class, was to get the variable -- in this case \(p\) -- alone.

Then he took them step by step through the process, adding 13 to both sides to isolate the \(p\). They ended up with \(-8 = p\). As they moved through the homework problems, the teacher kept repeating an algebra basic. "The numbers may change. The variables may change. But the steps don't change. Ever."

Heather Holder is one of those kids who has never liked math or done well in it.

To help such students meet the new algebra mandate, Hiram Johnson, like many other schools, has set up first-year algebra classes that span two years. The pace is slower, with lots of review; the goal is to make sure all the students not only pass but really learn it well.

When that day comes for Heather, it will make a bit of history in her home. Her stepfather, Joe Bowers, failed algebra in high school. In college, he failed it again, derailing his dream of becoming an architectural engineer. He went into the military, then began a long and satisfying career as a Sacramento police officer.

Her mother, Karon Bowers, took algebra in high school and despised every moment. She has only a vague recollection of passing the class and no memory at all of anything she might have learned. The subject now stands between Karon and a community college degree.

She is a clerk in the West Sacramento Police Department, where the degree would bring her more pay and a shot at moving up. She has completed 70 credits, more than enough for an associate's degree. But she needs to pass what she calls "dummy math" and an algebra course to complete the degree. "I dread the thought of taking those classes," Karon said. "I'm 38 years old, and I still don't want to do it."

Such bad memories are an unfortunate but common experience when it comes to algebra and math in general. "Math anxiety," as it is commonly
known, has become so widely documented that books on the subject turn up in self-help sections of bookstores, and waves of teachers get sent to training sessions to learn how to turn kids on to math.

Marilyn Curtain-Phillips saw so much math anxiety during 11 years teaching in South Carolina that she self-published a book on the subject called "Math Attack." "It almost seems like the popular thing to not be comfortable with math," she said. Out of all the math branches, algebra in particular has a reputation as an academic heartbreaker.

For generations, it sorted the college-bound from the rest of the crowd. "If you failed algebra, it meant there were a lot of things you couldn't do. So it's not surprising people have had a bad feeling about it," said Uri Treisman, a math professor at the University of Texas, Austin.

"For so many people, it is burned into their souls as a horrible experience," agreed Alec Ostrom, an assistant superintendent for the Roseville Joint Union High School District. Crossing this continental divide of mathematics has long been a rough rite of passage. Students must move from the familiar and repetitive arithmetic they have studied since kindergarten and navigate a new world of letters and symbols.

Suddenly, math looks like a foreign language. For many, it is a leap large and terrifying. "The whole idea that x is going to stand for something is really abstract and hard to grasp," said Kathy Zungri, a teacher at Spring View Middle School in Rocklin who works with students behind in their studies.

Agnes Nilson remembers the "x feeling" well. She took algebra in junior college and earned a D in the course. It was painful. She had been an A student up to that point. "Every time I hear the word 'algebra,' it's freeze-up time for me," said Nilson, 54, a communication technician for Pacific Bell. "X was my big stumbling block. I always wanted to put a real number in there."

People like Nilson shouldn't feel bad about their struggles, educators say. It often hasn't been their fault. Algebra is a subject notorious for being poorly taught. Difficulties actually start in the elementary grades, where the majority of teachers have neither a strong background nor an affinity for math.
The message that too often goes out to students: Math is a drag. "A lot of elementary teachers just do not like teaching math," said Pat Haddeman, an algebra teacher at Hiram Johnson High. "I've had some of my parents and students tell me that their teachers gave them math worksheets as punishment. It's no wonder there is all this math phobia out there."

When it comes to high school algebra, beginning courses frequently get doled out to coaches, history teachers and others without math backgrounds because of a long-standing shortage of qualified math instructors. In California, 40 percent of math teachers in grades seven through 12 have neither a major nor a minor in math, with the numbers running even higher in poor and urban neighborhoods. Those lacking a math background can draw on the math they know, follow a teacher's manual and get the basics across.

But when teachers don't have a deep understanding of the subject, algebra can get passed on as a bunch of isolated rules and formulas that to kids are not only difficult, but pointless.


The quality of teaching is not the only problem, Calandri and others said. The algebra deficit is exacerbated by students who arrive unprepared at its doorstep. If they don't know their multiplication tables or understand the concept of common denominators in fractions, they are guaranteed a rougher time in algebra. Heather Holder's teacher, Michael Duggins, sees it every day. A former Marine, Duggins has a powerful voice, infinite patience and a generous sense of humor -- attributes he puts to good use in his dual role as algebra teacher and arithmetic repairman.

The white boards in his classroom tell the story: Alongside the requisite x's and y's are daily doses of decimals, fractions and negative numbers that Duggins' students should have mastered in the elementary and middle grades. "Let me guess; the problem was the decimal," he said as he came upon a question that had stumped Heather and the others. It
involved adding .5 to 6. "I don't understand any of this," came a voice from the back. "Well come on up to the board," the teacher encouraged.

With all the new emphasis on algebra, educators are predicting the bad rap on the subject will fade. They expect to see more and more students coming out of school comfortable with algebra and jazzed about the opportunities it creates. The push is reaching all the way down into the elementary grades, with children as young as kindergarten now being introduced to early algebra concepts. It is a kinder, gentler approach designed to subtract the fear, the foreignness and the lack of preparation from the algebra experience.

But few expect all nightmares to end. "To teach algebra to everyone, we have to motivate the worst of our students, the ones who just refuse to do homework, who don't come to school, who miss as many as 20 days a semester. You can't learn algebra if you don't do the work," Calandri said. "The bottom line is, we won't give a diploma unless you have passed algebra," he said. "Will there be kids who don't get a diploma? I'm afraid there will be."

As with the generations that came before them, they will then face their algebra hangovers. Some will be like high school teacher Tim Broneck, the guy who got the F-minus and now laughs at the worst grade of his life. Or Brian White, the businessman who hated algebra but has found himself preaching its importance to his son. Or Mollie Burrows, a senior citizen from the Town and Country neighborhood who still wishes someone would explain the point. Others will take the approach of Julie Beall, who cried over algebra as a teenager. She tackled it again as an adult in her journey to become a teacher and now has the great satisfaction of helping her niece solve equations.

And some will be like Tina Casale, the woman who failed algebra seven times. She pours her heart out whenever the subject comes up. "It feels like physical wrenching every time I try to do it." She adopted Jimmy Buffett's "Math Suks" as her favorite song. And she has decided it is time to give up on x. It means no college diploma, but the misery will end.