

Excerpt from MONSTER'S PROOF

Prologue

The gray metal trunk arrived at 15 Beechwood Drive in River Oaks, Illinois, on a warm Thursday noon in July.

A delivery van pulled up to the curb, halting underneath a maple tree, its shade thick as fudge. Darby sat on the front steps of his house, playing with his Etch-a-Sketch. His mom had given it to him for his third birthday. Now, sevens later, he was an expert. His chubby fingers dialed the knobs, drawing conic sections. He especially liked hyperbolas. They made his teeth feel all zingy.

The delivery man opened the van's back door. Using a hand trolley, he wheeled the trunk down the ramp, leaning back against the heavy weight. On the side of the trunk, stenciled in thick white letters, was the name DR LUDAVICA ELL, and beneath that was a street address in Los Alamos, New Mexico, was locked with a three-digit combination lock.

The delivery man paused before the steps. "Hey, little boy, anybody home?"

Darby squinted against the bright sun. "Me."

The man waved his clipboard. "I mean somebody who can sign this."

"I can. I know how to write my name. In cursive, too."

"That so? Your mom home?"

"She's at work." Darby stood and yelled through the open door. "Dad! Somebody's here!"

Steps sounded, and a lanky man appeared in the doorway, a piece of chalk in his hand. The delivery man glanced at his clipboard. "Dr. Jerry Ell?"

Jerry's gaze fell to the trunk. "Here already? That was quick."

"What is it?" Darby asked.

"Aunt Ludy's trunk." He said to the delivery man as he signed, "The storage company had the gall to try to charge me for all the years they'd forgotten about it. Can you help me carry it up to the attic?"

"Ain't allowed. But listen, how about you write me a prescription for sleeping pills?"

"Sleeping pills?"

"Those damn Cubs. Get me all worked up and I can't fall asleep."

"Ah. I'm not a physician. I'm a professor. A mathematician."

"Hey. Wow. I've read about you guys but I've never met a real live one before. How about ten bucks, then?"

Jerry agreed.

The delivery man and Jerry hoisted the heavy trunk by the side handles.

Darby followed them into the hall, still carrying his Etch-a-Sketch. "What's in it, Dad?"

"Books," his dad grunted.

Darby's great-aunt Ludy was in a private home, near the big state hospital in Elgin. The Ells visited her twice a year. A brilliant mathematician, she had worked for the government on the first hydrogen bomb project. Top secrets buzzed in that frizzy white-haired head of hers. She'd been in

the South Pacific to see the bomb explode, and then a year later she had gone crazy. Now she wore an aluminum hat shaped like a star that she said kept alien numbers from reading her mind. Not only that, but government spies sometimes hid under her bed. She chased them out with her fractal sword, which was just a walking cane wrapped in gold foil.

Jerry tugged on the pull-down stairs, and the telescoping steps clattered open. The men hauled the trunk into the dim attic and stowed it in a corner by the old *National Geographics*. Through the dormer window Darby could see his nine-year-old sister Livey climbing a tree, with her best friend Chantelle giving her a hands-up.

After paying the man and closing the front door, Jerry returned to the attic.

Darby had just opened the combination lock. “Two five seven,” he announced.

“How’d you guess?” Jerry said.

“Two, five, and seven are prime numbers and 257 is a prime number, too.”

Jerry grinned. “That’s my boy.” He lifted the lid. Within the trunk were textbooks and math journals. He pulled out a thick tome and read the title. “Handbook of Mathematical Functions, Allen Fishbach, Editor.” Sitting down on a short stack of National Geographic magazines, he idly flipped through the pages.

Darby wormed his way under his dad’s arms. The pages were dense with formulae and equations.

“A bit advanced for you, son,” Jerry said. “One day you’ll understand them.”

Darby pointed to some scribbling in the margins. “What’s that?”

“Looks like something your great-aunt jotted down. Hmmm. She seems to be defining a Hilbert space of all Hilbert spaces—”

“What’s a Hilbert space?”

“It’s like our three dimensional space but much more abstract. Let’s see. She’s applying an operator to this function. . .” Jerry’s voice trailed off. He turned the page, where the scribbling continued. At the bottom, Ludavica Ell had written *Is this thingamabob for real? Needs proof.*

“Looks like she’s conjectured some sort of mathematical object,” Jerry said. He chuckled. “A thingamabob conjecture. I have a few of those myself.”

Darby pointed out the window. “Livey just fell from the tree.”

Jerry Ell tossed the book aside and rushed out to his daughter. She lay crumpled on the ground, her leg twisted under her. She was biting her lip hard, refusing to cry. Jerry sped her to the hospital’s emergency room. From there, he called his wife at nearby Fermilab, where she worked as a theoretical physicist.

Maria Ell drove as fast as she could to the hospital. After comforting her daughter, who was rather proud of the cast being put on her leg, Maria turned to her husband. “Where’s Darby?”

“Hunh?”

“Oh, for Pete’s sake, you didn’t leave him at the house all alone, did you?”

Jerry stared blankly at his wife.

Maria grabbed her hand bag. “You stay here with Livey. I’ll go home.”

Jerry thought for a moment and then called out after her, “He’s up in the attic.”

When Maria got home, she found her son still up in the attic, playing with his Etch-a-Sketch.

“Hi, Mom,” he said. “I have a new friend.”

She gathered him up in a relieved hug and pressed his nose. “Which friend is that?”

“Bob.”

She frowned, thinking of the neighbors. Did any of them have a boy named Bob? “Where does he live?”

“In Hilbert space. He’s funny. He looks like this.” Darby showed his mom the Etch-a-Sketch, on which he’d drawn a tangle of triangles.

“That’s wonderful,” Maria said. She absently picked up a book and chucked it in the trunk, which she slammed shut with her elbow. Darby tossed the Etch-a-Sketch aside and squirmed out of her arms. “Can me and Bob watch Scooby-Doo?”

His mother watched him dash down to the living room, shaking her head. After descending to the hallway, she shut the stairs.

In the stuffy, shadowed warmth of the attic, a little brown spider began to build its web on Ludavica Ell’s metal trunk.

Chapter 1 — Seven years later

Beep-beep-beep. Beep-beep-beep.

Godeliva Elizabeth Ell, known to all as Livey, opened a bleary eye to squint at her alarm clock. “Shut up,” she mumbled.

The rubberized alarm clock rolled off the lamp stand. It zigzagged around the room on its wheels, beeping louder and louder.

With a growl, Livey flung off her bedcovers and chased it down. She finally cornered the clock by her desk. “Shut up!” she said as she hurled it across the room. The clock bounced harmlessly off her dresser and fell silent to the carpet. Throwing it against something was the only way to turn it off.

Livey hated the thing with a passion, but she tolerated it because it did its job, which was to get a sixteen-year-old girl who was so not a morning person out of bed. One of her mother’s inventor friends had given it to Livey three years ago, just before her parents’ divorce.

After showering, she dressed in her blue-and-gold cheerleading uniform. It wasn’t a game day, but the River Oaks Record wanted classroom photographs for an article on the River Oaks High cheerleaders. From her desk, she picked up an old red Etch-A-Sketch that she’d found in the attic yesterday when she was looking for things to donate to a cheerleaders’ fund raising drive. She went down the hall and opened the door to Darby’s bedroom. Her ten-year-old brother was scrunched under the blanket, sound asleep with one of their dad’s math texts open on the cover beside him. He hadn’t taken off his glasses, which were skewed on his face.

Livey bent to shake him awake, but her attention was caught by the chapter title in the math book. “Mathematical Monsters and Pathological Math Functions.”

A lot of kids read horror comics for their chills and thrills. Her brother, on the other hand, read scary math. “Rise and shine, genius,” she said, shaking his shoulder. “Your Shedd Aquarium field trip’s today.”

He sat up, yawning. She showed him the Etch-a-Sketch. “Look what I found.”

He stopped yawning and straightened his glasses. “Where’d you get that?”

“In the attic. I want to give it away for a charity drive.”

“It’s mine,” he said, reaching for it.

“That’s why I’m asking.”

“You weren’t asking. You were announcing.” He studied the triangles drawn on the screen’s silver coating. His brows dipped and his face twitched as though he were trying to remember something. Then his expression smoothed. “Bob,” he said.

Bob? A distant memory came to Livey. “You mean your old imaginary friend? You were like, four. You’ve outgrown him and you’ve outgrown that. Can I have it?”

He shook his head. “It’s mine.”

Livey left the room with an exasperated sigh. He didn’t really want it, but he wouldn’t let her have it either, just on principle. Younger brothers, she decided, should be starved for a week each month, but in the kitchen, she dutifully made him his lunch, as she did every school day. Two slices of white bread with a generous slab of Skippy Super Chunk peanut butter, topped with grape jelly. Any grape jelly would do, but the peanut butter had to be Skippy Super Chunk. Darby wouldn’t eat anything else. As she munched on her own breakfast, a raisin bagel, she got out the casserole from the freezer and put it in the fridge to defrost for dinner that evening. Their housekeeper, Mrs. Blink, came in three days a week to clean and make dinners, including extra ones that she froze for the days she didn’t work.

Wiles limped to the bowl of dry cat kibble. As a kitten, he’d had an encounter with a garbage compactor that had mangled his right front leg. He sniffed the kibble with disdain and meowed at Livey.

She wasn’t moved to pity. “You know how many starving cats in India would love to have that?”

Her father rushed out of his bedroom, the edge of his battered briefcase sticking out of his backpack. “Morning, Livey.”

“Dad.”

“Yes?”

“Look in the mirror.”

He leaned back to look in hallway mirror, and blinked at the full coating of shaving cream still on his jowls. “Throw me a dish towel, will you?” He wiped off the cream. A big chin and long cheeks appeared. “Had this idea while I was lathering up. Wanted to write it down before I forgot.”

Livey just shook her head. After the divorce, her dad had become obsessed with proving the Riemann Hypothesis, the world’s greatest unsolved mathematical problem. Livey, who had trouble with basic algebra, knew more about the Riemann Hypothesis than she cared. The Hypothesis was this incredibly exciting idea that all the zeros of something called the zeta function were on a straight line. *Well, excuse me*, she thought, *the non-trivial zeros*. Mathematicians were always making a fuss over what was trivial and what was not. The way her dad was fixated on the stupid hypothesis, working all hours of the night on it, he was becoming bones and shadow and now unshaved bristles.

He chucked the towel in the sink and gave her a quick peck on the cheek. “Go Falcons.”

She gave him a look. “We’re the Eagles, Dad.”

But he was grinning. As he opened the hall door to the garage he said, “How come you never hear of a team called the Buzzards?”

A moment later, she saw him riding down the street. Other dads drove cars. Some rode bicycles. Her father? He rode his unicycle. Like he was a circus performer. It was so embarrassing to see him on that thing. There were times when Livey had to pretend she didn’t even know him.

Darby wandered out of his room, dressed in his blue school uniform, the collar of his jacket sticking up, his backpack slung over one shoulder, the Etch-a-Sketch in his hand. He paused in the hall for a moment to glance at the pull-down stairs to the attic.

In the kitchen, he shook the Etch-A-Sketch, erasing the triangles. “Didn’t Mom give this to me for a birthday present?”

When their mom had left, Darby had thrown away every single thing she had ever given him. The

Etch-a-Sketch had been a birthday gift. Livey even remembered the blue-and-white wrapping. “I don’t know,” she said.

Darby put the toy on the counter and plucked the meat cleaver from the knife rack. Using its dull edge, he smashed the glass.

“Darby!” Livey yelled.

“Don’t worry, I’ll throw it the garbage.” He pried open his lunch sandwich to inspect the contents.

“Did you use Super Chunk?”

“That was really stupid. You should have given it to me.”

“Is this Super Chunk?”

The other week, she had tried to trick him with a different brand. The sandwich had come home untouched. He hadn’t said anything, just whirred it into mush in the garbage disposal. “When have I ever not used it?” she asked, faking her offended tone.

With the tip of his finger, Darby pushed his glasses up his nose, leaving a smear of peanut butter on the lens. “Last Wednesday.”

Through the kitchen window, Livey watched him march out into the clear, cool September morning. The garbage cans were by the road side for pickup. He tossed the ruined Etch-a-Sketch into one.

Her poor brother. During the summer, his best friend Charlie who lived just a block away, had moved out of state. Then, two weeks after starting the school year at River Oaks Middle School, the teachers had thrown up their hands trying to teach a ten-year-old genius who read college level math texts for fun and who had re-written the U.S. Constitution for a history lesson. An anonymous donor had come up with a scholarship, and Darby had been transferred to the private and expensive Newton Academy for Gifted Children, way on the north side of town. He’d been attending for three weeks now and still hadn’t spoken of a single person there.

“God, please let him make friends,” Livey murmured.

A school bus halted at the corner where Darby waited, staring down at his shoes. He startled when the driver tapped on his horn. Squaring his shoulders, he climbed aboard.