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# Gooney Ducks and Naked Physicists

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Part LII  
The Ouzo Proof  
(Episode Two)  
K is for Klingon

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Abstract: An allegory of modern science.

### *Part LII*

*As a dreamer of dreams and a travelin' man I have chalked up many a mile  
Read dozens of books about heroes and crooks And I learned math from both of their styles  
Son of a gun, load the last ton...Son of a son of a sailor  
The sea's in my veins, my tradition remains  
I'm just glad I don't live in a trailer.*

Always wondered if Jimmy Buffett was related to Warren Buffett...

(Who knows? Maybe Uncle Warren and Cousin Jimmy are both wastin' away in Margaritaville, laughin' all the way to the bank...) Son of a gun! This is the life! Hangin' out with Eva, lying on the beach, nibblin' on wacky cake, watchin' the sun bake...

Yeah, *it's not far down to paradise...at least it's not for me:* the gulls, Eva's boat, the *Rudder Chaos*, dancing gently on the waves, and the shadows from the sunlight softer than a lullaby. Closing my eyes, I'm on the palm-studded, sun-drenched Riviera.

What sweet oblivion! We set sail from Sequim, doin' a little island hopping through the San Juans...Yeah, loose logs and tricky tides. But, no worries; Eva really knows her larboard from her starboard. She's our nifty-navigator and top-notch captain. (I call her my sweet little "helm hog"! ) Uh-huh, I could get used to this. Even a detached, debonair, hard-nosed ace detective like me's gotta take a break sometime...Oooh, Eva just brought me a cool drink and a sandwich before headin' out for a little beach combing. (Yeah, eat your heart out, Popeye! Doesn't my Olive Oyl take good care of me? Pampered? I love it!)

I started reading that book you left. That's right, now Dr. Z's at sea with me! I'll try to keep him dry. Dude writes some pretty interesting stuff, non? Who knew? Pi was just another bug on the windshield of life! Looks like I'm gonna have to unlearn all the math I learned in school. (Shouldn't be too hard, considering I was always daydreamin' anyway, ha ha!) Sure great here on the beach; but gettin' a little heat-drugged. Think I'll move into the shade. Perfect weather for some slow dozin'. A fella could dream some serious dreams here...

*Huh, here comes that long-legged beauty running up the beach...Ah, beauty in all she is.  
Dropping to her knees into the sand beside me, Eva breathlessly blurts out,  
"Sammy, Sammy, wake up! Check it out! Look what I found!"  
(Rubbing the sleep from my eyes), "Hey, sh-weetheart, look at that—an old ouzo bottle."  
"Yeah, there you go, Romeo. But look inside."  
"Ah ha! A message in a bottle. Gotta be a whale of a tale behind that..."*

*To whom it may concern:*

*Help! Mayday, mayday! The message in a bottle? You guessed it. The drama's done. Who'd a thunk: Klunk, klunk, we got sunk! In the midst of the storm, there was a sickening groan and shudder. Orders came down for all hands to abandon ship! In the ensuing confusion and scramble, in the desperate darkness, Harm, Mac, Dr. Z, and I got thrown together into one lifeboat. As we watched the good ship Falmath disappear into the vortex, the suction of the sunk ship reached us, and in despair, we cried out as our lifeboat also swamped and foundered! Yep matey, things looked pretty grim for Tiny Tim. But just as quickly as it had come, the storm abated. Like Ishmael clinging to Queequeg's coffin, "for almost one whole day and night, we floated on a soft and dirge-like main. The unharmed sharks, they glided by as if with padlocks on their mouths; the savage sea-hawks sailed with sheathed beaks. On the second day, a sail drew near, nearer..."*

*Yessirree, Uncle Hermie...count on the Admiral. He and Archimedes had somehow rigged a makeshift sail. No boatswain's call, nobody "piping us aboard," but man, were we ever glad to see that monkey fist come flying toward us. (Sharona's got quite an arm...did I tell you she tried out one time for catcher with the Mariners? Yeah, she's in a league of her own.) What a relief, to be plucked from the sea! Hugs, tears, and three cheers!*

*And what a scene...Dr. Z and Sharona reunited? I'll always treasure that image, as fleeting as it was unforgettable. Brought tears to my eyes...*

*Unceremoniously hoisted over the gunwale, like a freshly caught tuna, I gasped and sputtered: "Permission to come aboard, sir?"*

*The Admiral (A.J.) replied: "Permission granted! Welcome aboard, Mr. Roberts!*

*Good to see you safe and sound. From now on we're gonna have to hang together out here."*

*Aah, beneath the Southern Cross...*

*'Sailing a reach before a following sea, Off the wind on this heading lie the Marquesas...'*

*The Admiral said he remembered some island around here—not on the charts.*

*We're sailin' towards that. You know...this ain't half bad; might even get in a little fishin'.*

*Archie: "Don't mean to break into your musings, Bud. But, I still have my ouzo bottle, the felt tip, dry napkins, and some time to kill. You up to hearin' the rest of the story?"*

*Me: "What's that, Arch? Oh, sure. Why not? Lemme see...where were we? Big Z's dream: How to find the area around a sphere, cylinder, cone and of a circle all without using pi.*

*Yep, you were about to gimme the low down skinny on getting rid of pi from all equations..."*

Dr. Z: “Yeah, Archie’s thinkin’ about writing a book of our adventures—The Unsinkable Proof. If I had my druthers, I’d call it: Everything You Wanted to Know About Geometry but Were Afraid to Ask.”

Archie: (chuckling) “But seriously, Bud...way back when (in one of my previous books), I found the value of pi lay somewhere between 3.140 and 3.142:

$$3.140 < \pi < 3.142$$

But that’s just it—pi never resolves. And that’s the problem. Pi put us in a pickle! With pi in an equation (like in the old equation for the area around a cylinder),

$$A = 2\pi rh,$$

the result will always be less than or greater than the actual area:

$$2\pi rh < A < 2\pi rh.”$$

Me: “I see. And since anything less than or greater than an area sure can’t equal that area...the old equation using pi can never equal the area around a cylinder!”

Archie: “Nai, nai! Now you’re ‘onboard,’ Bud!  
With pi in an equation, you can never get an exact result!”

Me: “Gee willikers! So all along pi’s been the hitch in the giddy-up!  
Pi makes it impossible to calculate any area!”

Archie: “Yeah, Bud. Without pi, finding an area (dare I say it?) is easy as pi!  
Lemme demonstrate. If I wrap this napkin around my ouzo bottle, like so (snug as a bug in a rug), the napkin becomes a cylinder. And using my felt tip to mark the edge of the napkin, where it overlaps, I can unfold the napkin/cylinder, lay it flat, and...Bam!  
My ready-made rectangle is the exact area around a cylinder! Voila!  
Come to think of it...I’ll bet that’s somethin’ the label maker already knew.”

Me: “So I guess the real equation for the area around a cylinder is the circumference around the ouzo bottle times the height of the napkin, or...

$$A = (C)(h). “$$

Dr. Z: “A little early in the day, Bud, but I’ll drink to that!  
The Ouzo Proof! Straight from Mr. Math himself!”



*Me: "Hold on! I feel like I just made the jump to warp speed and blasted right by the math of the past! Now I see why you guys are all wound up! There's a method to your madness!*

*This 'Ouzo Proof' is the real deal—a first in geometric history!*

*Yeah, you guys have the first absolute proof (and I'm not speaking of alcohol content) of how to find the exact area of a circular form! Wow!*

*And it's so simple: no calculus, no complicated diagrams, no pi... just an ouzo bottle and a napkin!*

*I gotta say, lads, I'm impressed! Kudos, guys!*

*No wonder you're in all the history books, Arch! You boys are the math aficionados!*

*And I just realized: As the area around a cylinder is equal to the surface area of a sphere (of the same height and width), and the surface area of a sphere is equal to four times the area of a circle (of the same diameter), that means your 'Ouzo Proof' is the absolute proof for finding the exact area of all circular forms! Wow!*

*But guys, guys...I just had another thought.*

*Wouldn't your proof also mean that Euler's definition, that pi ( $\pi$ ) is equal to half the circumference of a circle of radius 1, is false?"*

*Dr. Z: "Whoa there, pardner. Take it easy. Slowdown.*

*You're getting a little ahead of us. But sure, you're absolutely right.*

*Half the circumference (half the length around an ouzo bottle) is an actual length, but pi is unresolved. So pi can't be equal to anything!"*

*Me: "Yeah, anything less than or greater than a length can't be equal to an actual length. And here I was thinkin' you were gonna bore me with some tedious and tiresome math tale. Man, y'all surprised me!*

*Tip of the iceberg? Titanic?*

*Why, you boys just sunk the whole darn math fleet!*

*But before we kiss pi goodbye, I do have one objection—a small glitch. Call me a 'Cling-on,' Cap'n Kirk, but..."*

*Archie: "Ooh, there's an image—All those 'Klingons' out there hanging onto pi. But what is it, Bud? What's the hiccup, Worf?"*

