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# The Cairo Affair

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## Squeezing the Kumquat

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Editing contributions by Daniel Birks

Abstract: An allegory of modern science.

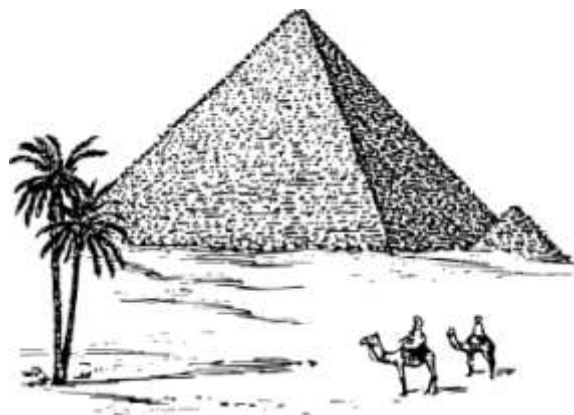
## ***Squeezing the Kumquat***

***Intrigue, adventure, romance—with a dash of math thrown in on the side?***

***Shrouded in the mists of history, set against the wondrous backdrop of the Great Pyramid, this masterful, spine-tingling mystery will take you on a ride where the shocks come fast and furious!***

***Don't be misled by the sappy, milquetoast title. This tasty tale is your passport to the land of 'milk and honey,' to a great intellectual awakening, to a new realm of understanding and enlightenment!***

***A must read!***



***Archimedes—that suave, debonair, man-about-town Greek hipster mathematician and the original master of suspense—has kept science on the edge of its seat, holding its breath, for over 2000 years! But what about now? Can the world be saved from itself—convinced (at last) to no longer lay its head, like Samson, in Delilah's lap? Can C/d be resolved? (Will the big bamboo-zle end and Trump be restored to office?) Will the truth finally prevail? The fate of humanity hangs in the balance!\****

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***Available where good books, scrolls, and papyri are sold.***

***E.Q.: "How's that for an action-packed blurb, Arch?"***

***Archie: "Bye-bye, Bidenites and Trumpy back in the 'House'? I like that part. But Samson's nap on Delilah's lap? Shaved by a dame who he thought was his flame? Science gets a supercut? A math tale of 'biblical' proportions? I'm at a loss for words, Q."***

***Dr. Z: "Ah, the Great Pyramid...I always wondered who built the thing."***

***Archie: "No mystery there, Z. It says right in Colossians 1:16: 'For by Him were all things created, that are in heaven, and that are in earth, visible and invisible...'  
So, directly or indirectly, you could say everything's built by the Head Honcho!"***

***E.Q. (chuckling): "That's a fun way to look at it. But hold on. Let me make sure I've got this right. So you're saying, Jesus built the pyramid? Haven't heard that one before!"***

Archie: “Sure, if you can build the Rockies, the Himalayas, the Alps, the Moon, the Sun, the Earth, and THE UNIVERSE...a pesky little pyramid would be a snap!”

Dr. Z: “Hmm, built by the Prince of Peace? Bringing unity, harmony, and accord to the world of math with God’s-o-metry? Guess we could redub it the Pyramid of Peace! Shalom! But shucks! There goes my screenplay about purple people from Pluto and the Great Pyramid being constructed by ‘Nephilimic’ ants from outer space visiting the hapless Earth!”



Archie (shaking his head): “GiAnts? Sounds like a ‘Bee’ movie. Time to take a GiAnt step Back to the Future, Marty McFly! I think we can safely say only God knows who built the darn thing.”

Dr. Z: “Hear, hear! But let’s cut the banana oil...whoever it was, the ‘Math Santa’ sure left us a fun package to unwrap!”

E.Q.: “Yeah, it’s like the entire language of geometry written in 3D! The obvious outside—the square base and triangular sides. And then surprise, surprise! The treasure trove inside—the ‘hidden’ key—the proportions based on the ratio of a circle!”

Dr. Z: “Right on, Q! Ingeniously ingenious! With the vertical height of the Great Pyramid having the same relationship to the perimeter of its base as the radius of a circle has to its circumference (which is true for every horizontal layer, wherever you slice it)...the pyramid’s a great big stack of ratios of similar circles (of  $r/C$  or  $C/r$ )! It’s proportionality in practice!”

E.Q.: “And since all circles are similar (and the ratios of  $r/C$  or  $C/r$  are equal for all circles):

- Starting with the ratio of the Great Pyramid’s vertical height to its base perimeter (the radius,  $r_1$ , to the circumference,  $C_1$ ),
- You could choose a radius of any other circle—no matter how big or small,
- And use the cross-multiplication equation,

$$\frac{r_1}{C_1} = \frac{r}{C} \quad \text{or} \quad \frac{C_1}{r_1} = \frac{C}{r} \quad \text{or} \quad C_1 r = C r_1 ,$$

to calculate the length of that circumference! Yep, you’d never have to measure another circumference again! So the ‘GP’ is a ‘GPS’—a **Great Pyramid System of measure**: showing that, with the ratio of a circle’s radius and circumference, you can measure the universe!”

Archie (opening his book): “But there’s even more to it, Q. If you look at my diagram—”

Dr. Z: "Huh, that could be a plan of how to construct the Great Pyramid. But what's that triangle on the bottom, Arch—the 'GiAnt' ramp they used to haul up the big stones?"

Archie: "Ha ha. Quite a sense of humor, Z. But like I was saying...as my diagram shows:

**The area of any circle is equal to a right-angled triangle in which one of the sides about the right angle is equal to the radius, and the other to the circumference, of the circle."**

E.Q.: "Well I'll be a mummy's uncle! The rise and run of your 'ramp,' the right triangle, K, has the same ratio of the radius and circumference,  $r/C$  or  $C/r$ , as the Great Pyramid!"

Dr. Z (interjecting): "I know I have to rise and run whenever I eat too many kumquats."

Archie (with an indulgent smile): "Little too much information there, Z. But you're right, Q. Take the vertical height of the Great Pyramid,  $r$ , straighten out the base perimeter,  $C$  —"

E.Q. (laughing): "And Bob's your uncle—you have the right triangle K! Wow, that's wild! The Great Pyramid is a pure geometric equation for the area of a circle in disguise! So who needs an equation? Creating a triangle with the slope of  $r/C$  (the radius to the circumference) creates the area of a circle! That makes it all too easy, Luigi!"

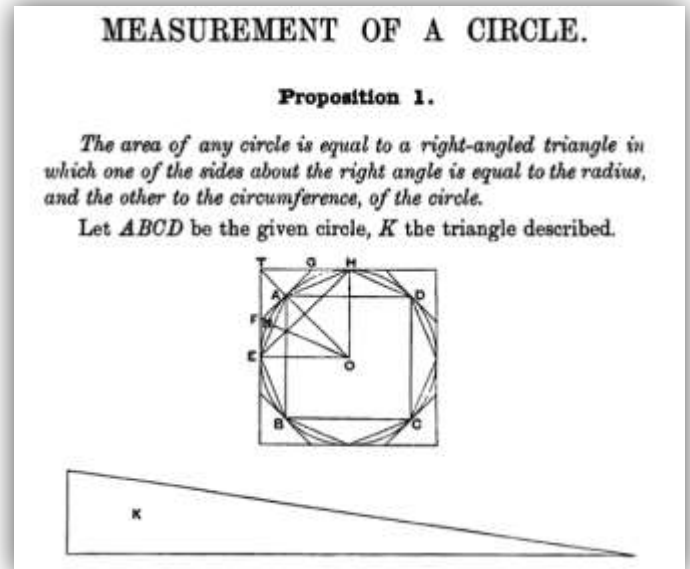
Dr. Z: "Yeah, but if you did wanna write an equation...as the equation for the area of triangle is half the base times the height, the equation for the area of a circle would be half the circumference times the radius:"

$$\left(\frac{\text{Circumference}}{2}\right) (\text{Radius}) = \text{Area of a Circle} \quad \text{or} \quad \left(\frac{C}{2}\right) (r) = \text{Area}$$

Archie: "Right. Just flip the script and multiply the ratio instead of divide. But I like to think of it as multiplying half the arc length times the radius."

E.Q.: "You'll have to explain that, Arch."

Archie: "Will do, Q."



Archie (continuing): “In my diagram, I inscribed and circumscribed squares in and about a circle. And by bisecting the arcs AB, BC, CD, DA, then bisecting the halves, and so on—”

E.Q.(excitedly): “Oh, I see!

Bisecting the arcs creates triangles!  
And bisecting those triangles creates geometric equations for the areas of triangles—half the base times the height!”

Dr. Z (picking up a napkin and Sharpie):

“That makes the area proof simple!

If I draw three of your ‘triangles’—one with a base bigger than the arc of the circle,

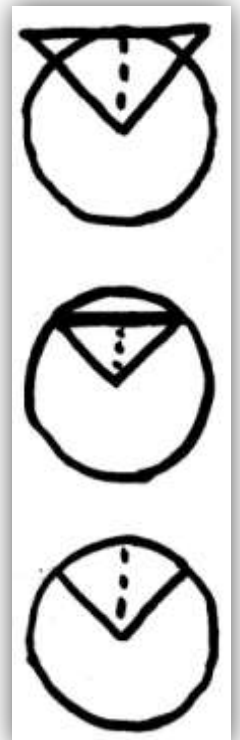
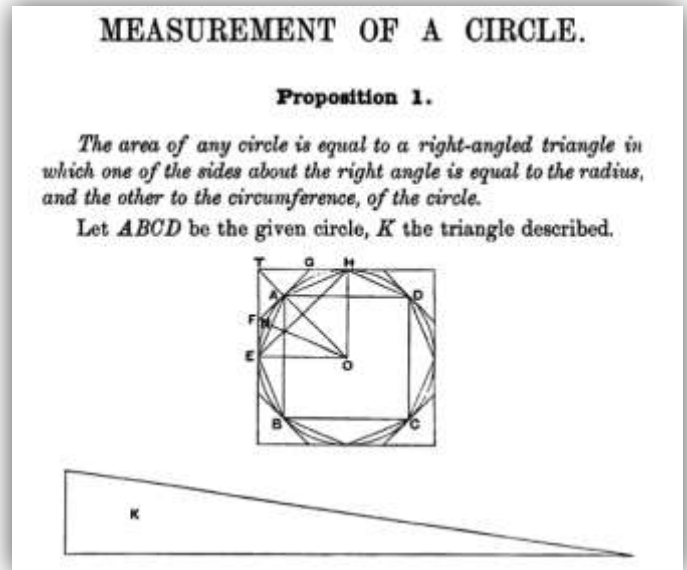
another with a base less than the arc, and one with a base that is the arc of the circle—the only ‘triangle’ that can equal that area of the circle is the one with the actual arc.”

Archie: “Exactly, Z. Anything greater or less than an area can’t equal the area. So if you look at the bisected ‘triangles’ as area equations (with one greater than, one less than, and one equal to the area), the only equation that can possibly equal that area of the circle is half the arc length times the radius!”

Dr. Z “Ah, so you use the same area equation for a portion of a circle as you do for the entire circle! Wow!”

E.Q.(gleefully): “Well, boys, now we know how to hit their curve: just invent a new type of triangle! A two-dimensional geometric figure formed of three sides? Yeah, nobody ever said they all had to be straight! Time to ‘stop the book’! This blasts us into a new type of math—circulation equals triangulation! What a revelation!

So, Arch, like the Great Pyramid, your ‘Pac-Man proof’ shows:



**You can treat the length of the curved arc of a circle as the base of a triangle!”**

Dr. Z: “Or like it says in Luke 3:5: ‘The crooked ways shall be made straight, and the rough ways smooth.’ ”