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The Triangle Problem or What's Wrong with the Obvious Truth

They say seeing is believing, but what happens when the most obvious answer deceives you?

We've all heard that you can lie with statistics. That by fudging the numbers just a little bit, or by asking the wrong question, making the graphs look bigger/smaller than they should be, and so on, you can exaggerate or completely fabricate the truth. And we all know that there's a fundamental problem with most discussion on the internet because you can't prove anything anyone says, so it all boils down to a matter of opinion, shouting, and logic puzzles designed to get the other person to concede "yeah, maybe."

Well, never has this been more obvious to me than in the Triangle Problem. I don't know how old this is, or where it comes from, but I've seen it in a handful of places on the internet, even in another language (maybe that's where it originated?). On first glance, it looks impossible, but after doing some research, I saw the subtle lie that was being perpetuated right before my eyes.

I give it to you exactly as I found it (well, except for adding my website to the corner so I get at least a little promotion from hot linkers).

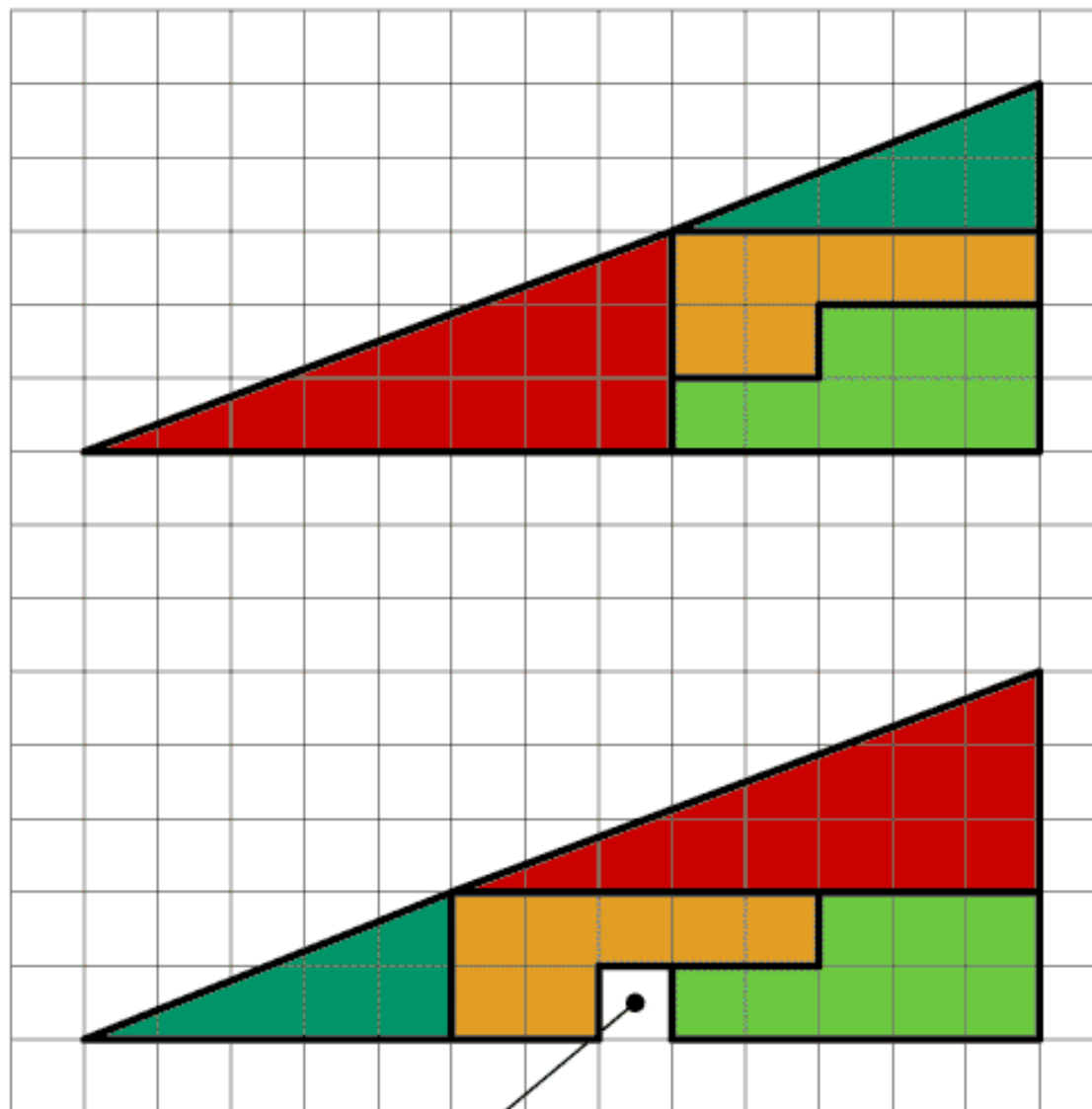
Activities

- Comparing the Presidents: 2012 Election Edition
- How to find a job.
- Being Productive with only vaguely defined goals or How do I find time for it all?
- 8 Affiliates Scams You Need To Look Out For.
- Stores and Magazines
- What 100 years of book sales tells us about human nature
- Addiction by Design
- The Four Types of Traffic
- The US Government Budget & Debt (Obama Edition)
- Magic Happens Here
- A Complete Waste of Time (small & free video games) (updated)
- My Favorite Smallware (updated)
- List of Outliners

Popular Pages

- My Favorite Smallware
- Ohms, Amps & Speakers
- The National Debt
- A Complete Waste of Time (games)
- The Google Proxy
- Global Oil Production & Consumption
- Comparison of Outliners
- Room Mode/Standing Wave Calculator
- The Triangle Problem

HOW CAN THIS BE TRUE ?



Below the four parts are moved around

The partitions are exactly the same, as those used above

From where comes this "hole" ?

The Answer Is On www.MarkTAW.com

Try and figure it out before continuing on. Some people intuitively "get" it, but you have to understand what's going on. Other people don't get it, even once it's been explained to them.

- The US Trade Deficit

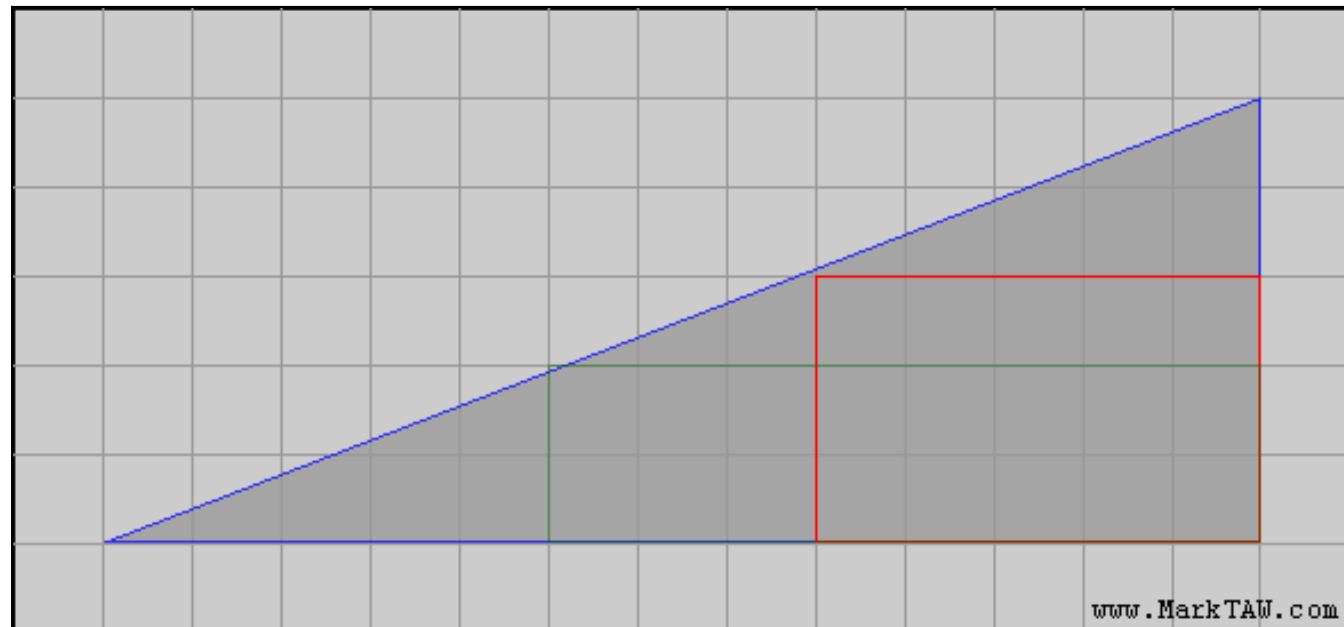
This is obviously impossible. If the triangles are the same size, then how can we create an area that has 1 extra space? And it's obvious that the triangles are the same size - 8 long by 3 high, and 5 long by 2 high.

Staring at the picture for a while you begin to notice subtle things that seem wrong but can't possibly explain such a large hole. If you look at the bottom picture you'll see that the green triangle is exactly 2 high, but the if you look at the top drawing, the red triangle passes just *under* that spot in the same place. And if you look at the top picture, you'll see that the red triangle is exactly 3 high, but the picture on the bottom crosses just *over* that spot in the same place.

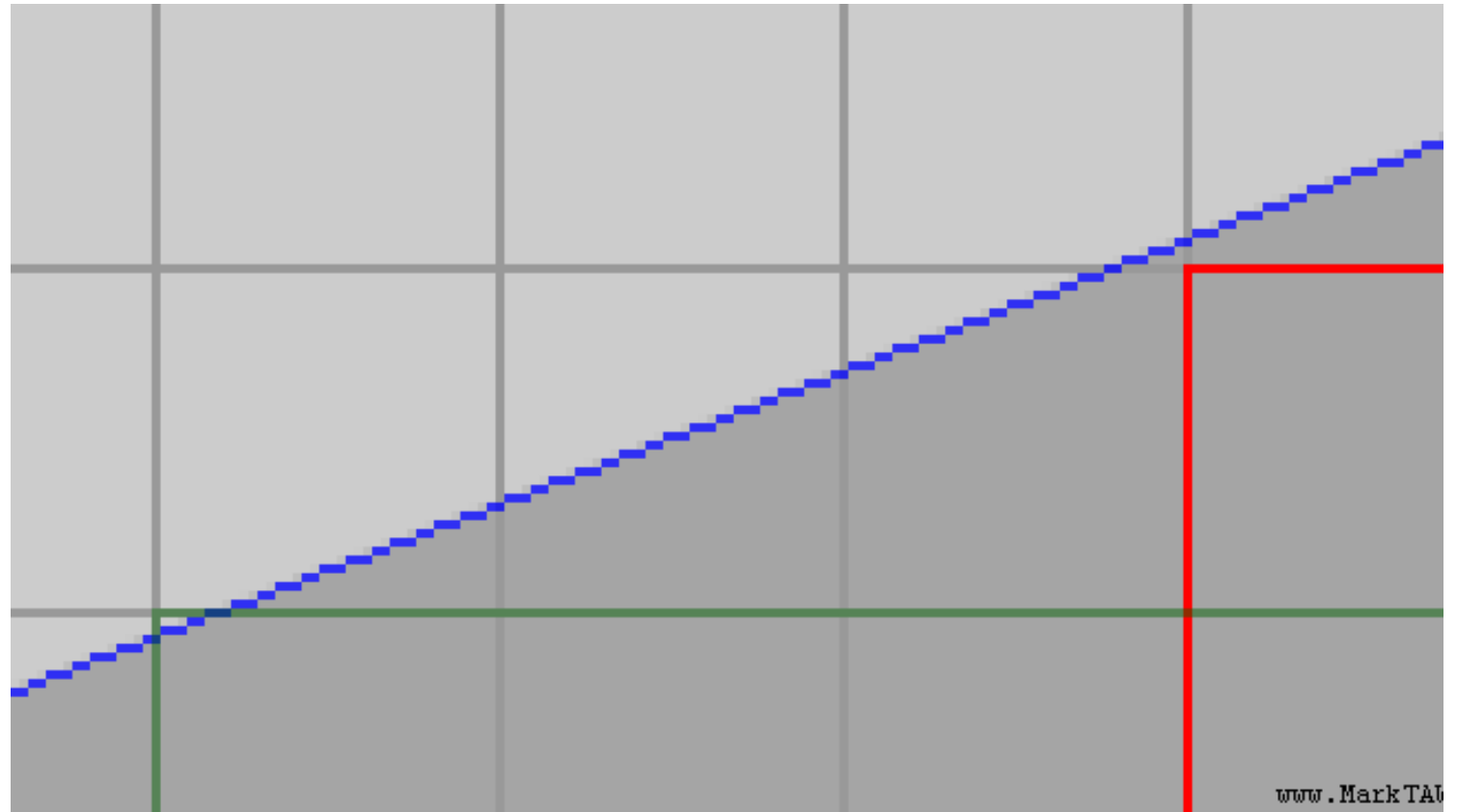
The top triangle just looks a sleight bit bigger than the bottom triangle, but by looking at the red & green triangles themselves, they're always the same number of boxes, and more importantly, the triangle as a whole is always the same size: 13 x 5.

The truth is, this isn't a triangle you're looking at. It's two different four sided figures. The apparently straight line that connects the bottom left to the top right isn't straight. It's two different lines, and that accounts for why the top drawing doesn't line up with the bottom one exactly, even if the shapes appear to be the same basic size.

Let's forget about the smaller triangles for a moment and draw the boxes. One is 3 x 5, and the other is 2 x 8. (my apologies to anyone who may be color blind, I can re-do these drawings if you need it).

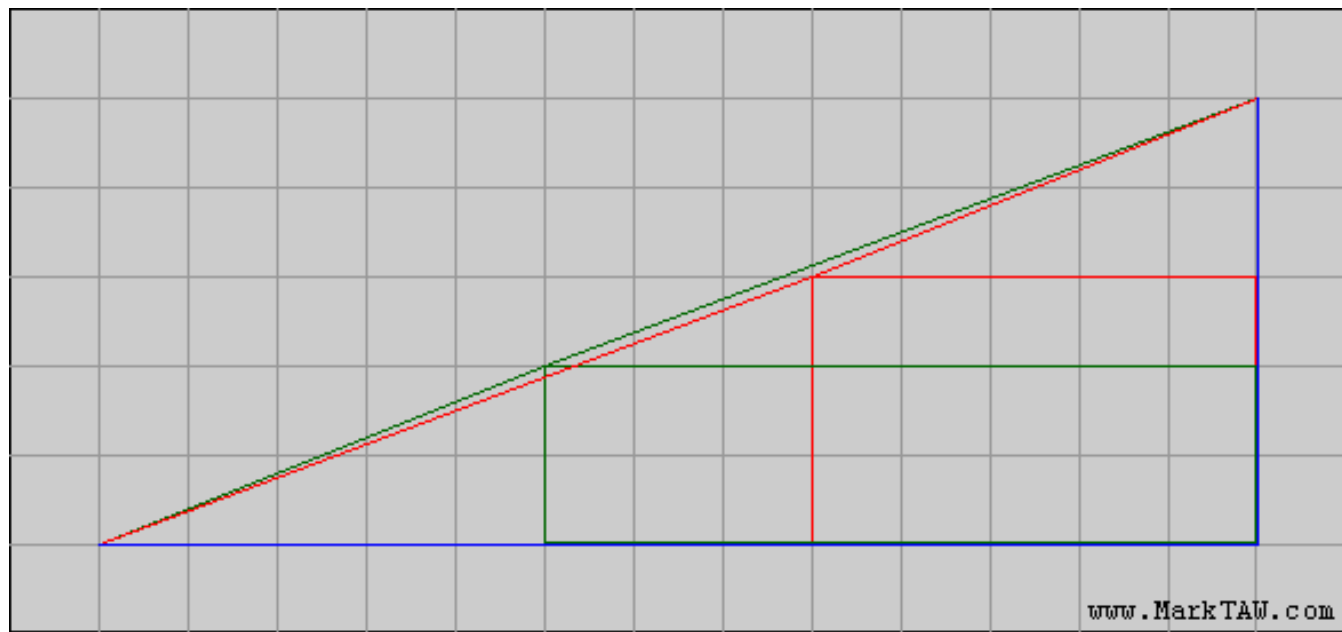


If you look closely, you'll see that the 3 x 5 red box is on the inside of the gray triangle area, and the 2 x 8 green box is on the outside. Let's zoom in a bit so you can see that easier.

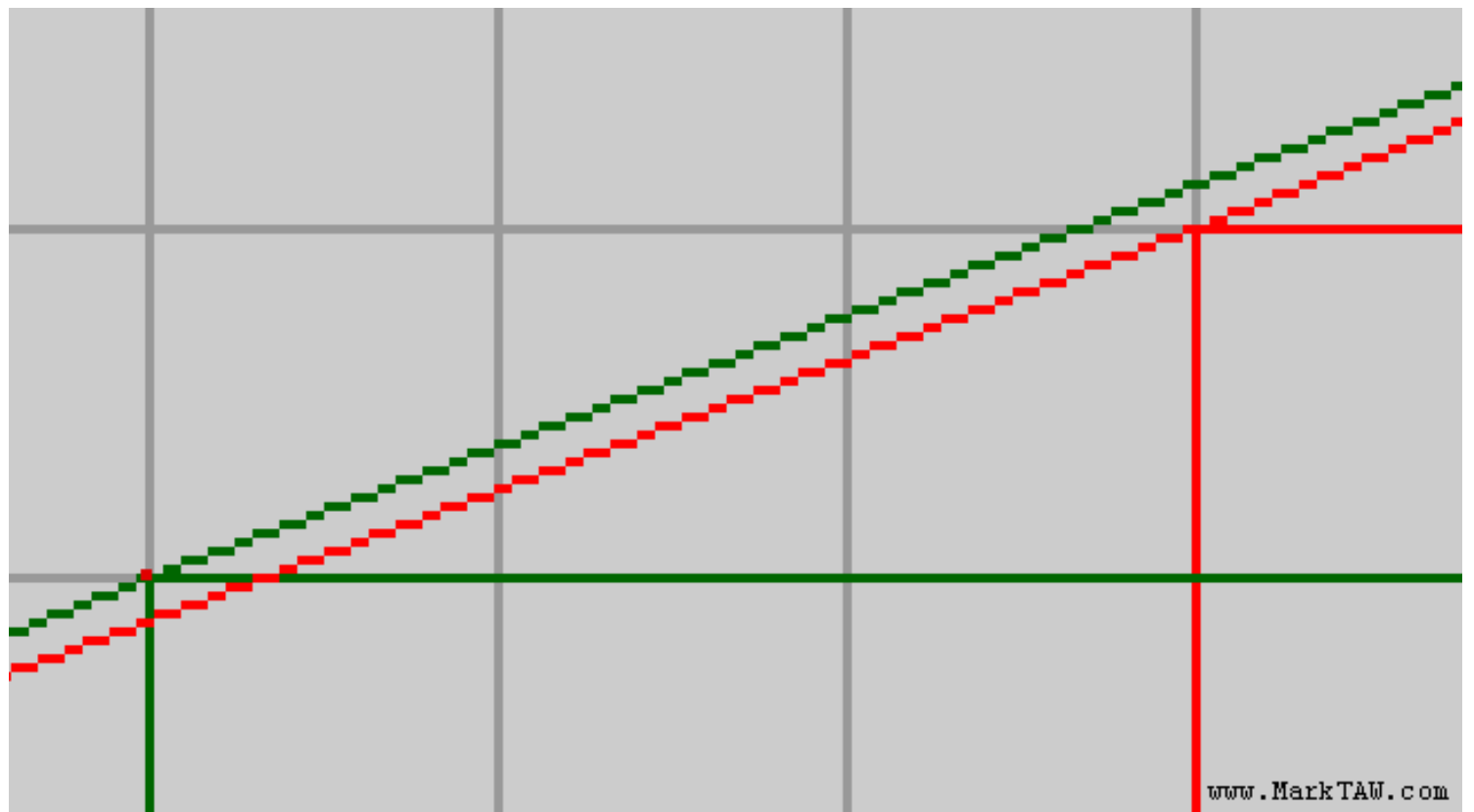


That's such a small difference though, it can't account for an entire box being created, can it? Let's look at the two triangle again, this time, superimposed one on top of the other.

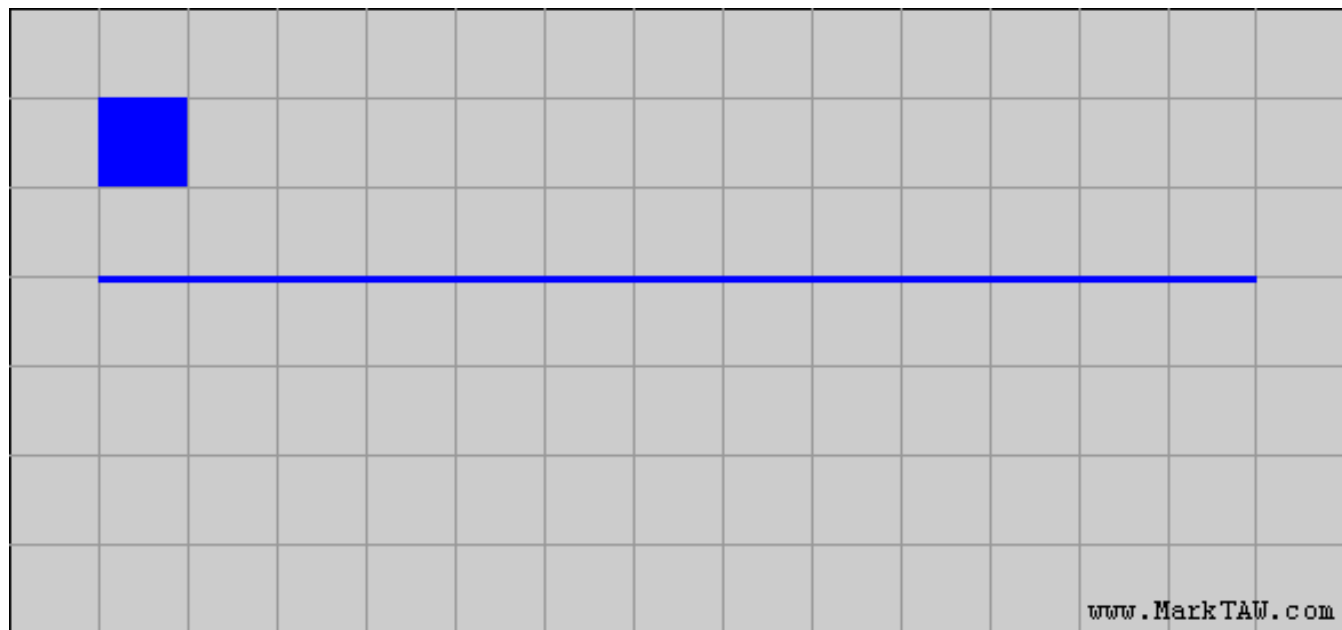
Here you can see clearly that the 2 x 8 green box is just a little bit outside the line, and the 3 x 5 red box is just a little bit inside the line. Neither falls exactly on the line. You can also see more clearly the difference between triangles created by the green and red boxes.



and again, zoomed in



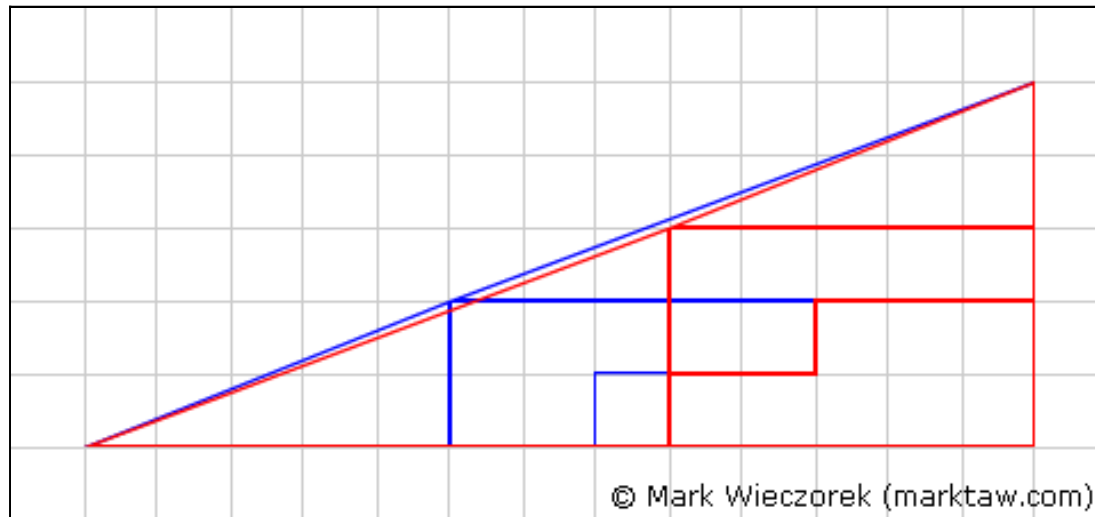
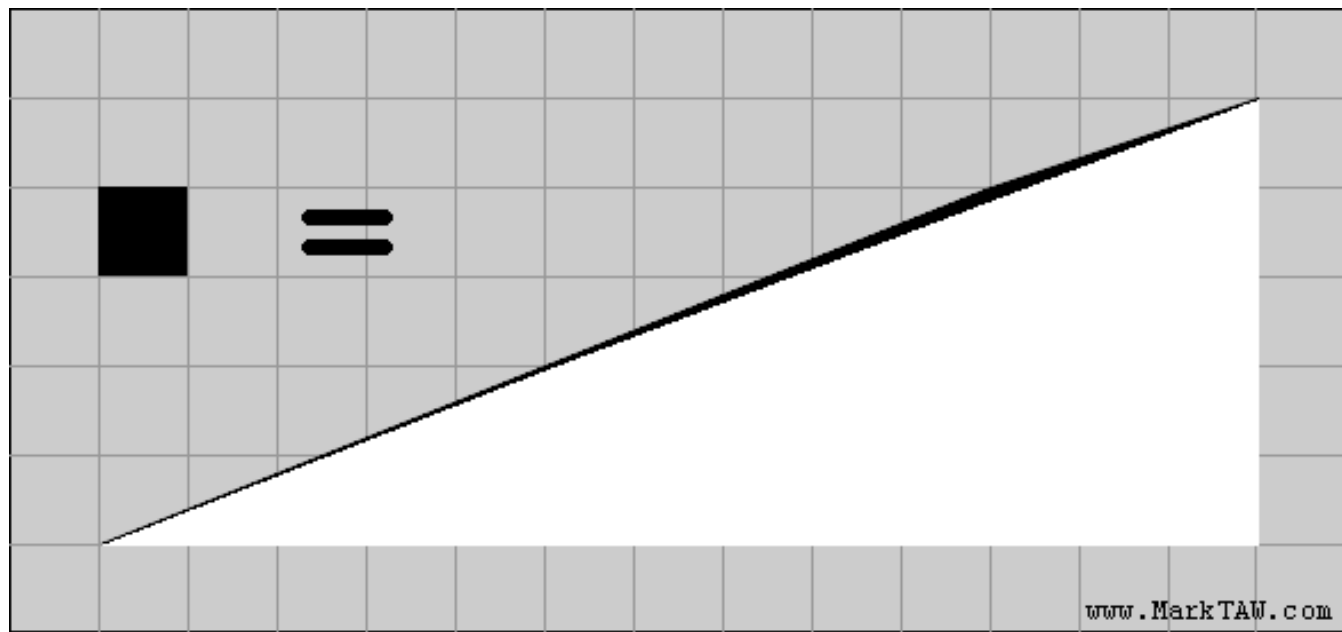
Okay, so some of you are saying "wait, not nearly enough space to make up for the size of the box." Well, what you aren't taking in to account is just how little space a box would take if stretched out over a diagonal line that stretches 13 wide and 5 high. Here's the box just stretched 13 wide, without even thinking about 5 high.



Now, perhaps, it's conceivable that the small differences between the two shapes could create an apparently larger hole in one of them. Go back and look at the original image, and this subtle curve in the line you thought was straight should be a little more obvious.

And that's the problem with most apparently objective truth. Even when it's staring you in the face, it's impossible to tell that one of the two "triangles" is exactly 1 box bigger than the other, or that they're not even triangles at all, but four sided figures subtly arranged to look like triangles.

It's also the problem you have when trying to explain a subtle truth to someone who lives in a world where all apparently straight lines are straight and there's no possible way a small deviation from straight could lead to such a large change to the whole.



- sciforums.com - Confusing Triangle
- [hole explained](#)
- ["hole" explained](#) <- one of the explanations here is really funny because it totally discredits the idea that the small change in angle could account for the large hole, and goes for the obvious explanation: simply rearranging the triangles created the hole.
- [The Mysterious Square Problem](#) Good explanation of missing square with a small graphic that exaggerates it.

page first created on Sunday, January 09, 2005

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