a_0 and a_1 in the power series for $f^{-1}(0)$, the Dottie Number. This method requires students to compute the nth derivative of f^{-1} at $\pi/2$ in terms of the first n derivatives of f at $\pi/2$. By the way, $a_0 = 1/4$ and $a_1 = -1/768$.

In my Chaos course I make sure to tell the story of the Dottie number right away—without the punch line—and ask them what is going on. They repeat the experiment themselves and make conjectures. We come back to this example every time we learn one new element of finding attracting fixed points and domains of attraction.

In my complex variables class, we show that $\cos(z) = z$ has infinitely many complex roots that come in complex conjugate pairs (except for the Dottie number). We do this by studying the complex form of $\cos(z) = (e^{iz} + e^{-iz})/2$. Later in the complex variables course, I introduce complex dynamics. When we get to Julia sets, we compute the Julia set numerically for $\cos(z)$ and see the domain of attraction for d. The other roots are repelling.

It is unlikely that the Dottie number will enter the annals of great constants alongside e, π, the Golden Ratio and many others. However, the Dottie number and its story might make good teaching elements for others out there. I also imagine there are many other interesting facets of the Dottie number yet to be discovered. I look forward to hearing about what you find.

$$\mathsf{d} = 0.73908\ 51332\ 15160\ 64165\ 53120\ 87673\ 87340\ 40134\ 11758\ 90075$$
$$74649\ 65680\ 63577\ 32846\ 54883\ 54759\ 45993\ 76106\ 93176\ 65318\ldots$$

Proof Without Words: Alternating Sums of Squares of Odd Numbers

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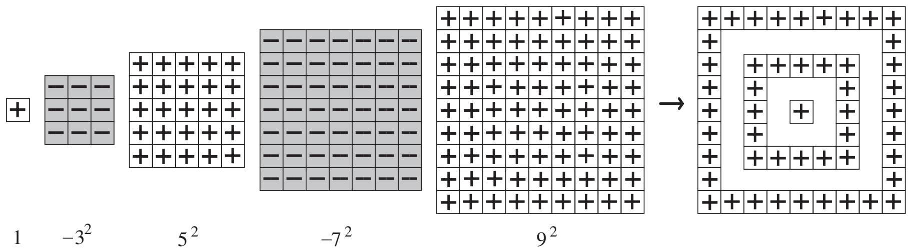
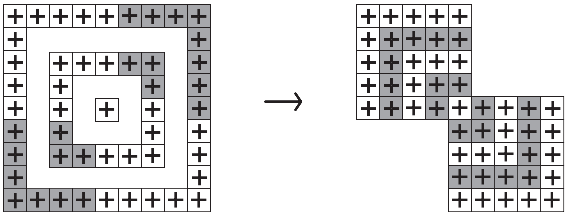
If n odd:

$$\sum_{k=1}^{n} (2k-1)^2 (-1)^{k-1} = 2n^2 - 1$$

E.g. $n = 5$:

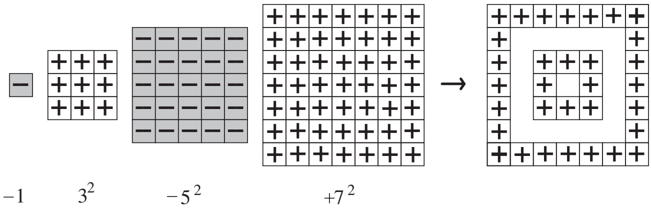


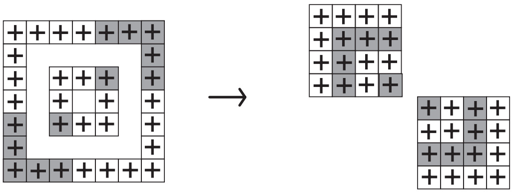


If n even:

$$\sum_{k=1}^{n} (2k-1)^2 (-1)^k = 2n^2$$

E.g. $n = 4$:





REFERENCE

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An Integral Domain Lacking Unique Factorization into Irreducibles

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Long ago I studied at Adelphi University. Teaching there at that time was Donald Solitar. An associate told me that Solitar was working on an abstract algebra textbook whose selling point would be lots of great examples. When I asked for one, I was shown the following, which, until recently, I had never seen in print. I have now learned that it has appeared in a book by Rotman [**1**]. Whatever its provenance, this example deserves a wider audience.