

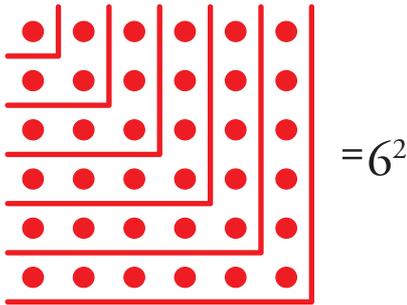
MathSnacks

by Marty Ross,
Burkard Polster,
and QED (the cat)

Quit and
Eat
Dinner

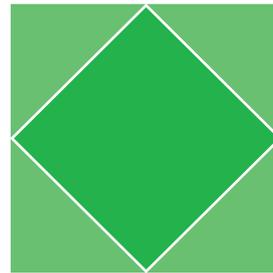
Oddometer

$$1+3+5+7+9+11$$

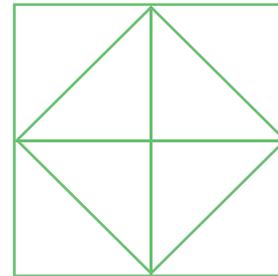


The numbers of dots in the six L-shapes are the first six odd numbers. These form a square, and therefore the sum of the first six odd numbers is 6^2 , the number of dots in the square. What is the sum of the first 1000 odd numbers?

Square Squared



A famous story has Socrates showing that the large square has exactly double the area of the small square. Is this obvious? Pick a couple of contestants and ask them to have a go at proving this. Then show them the following division into congruent triangles. How many such triangles are contained in the rotated square and how many in the large square?



$$0.9999999\dots = 1$$

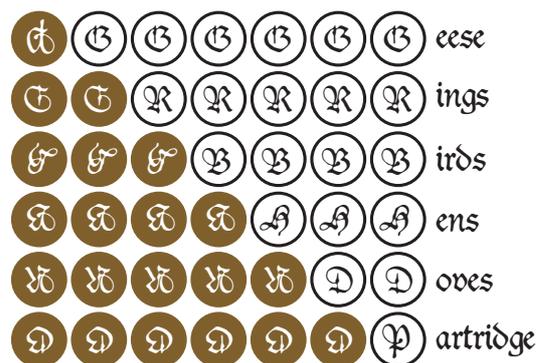
Proof: Set $x = 0.999\dots$. Then

$$\begin{array}{r} 10x = 9.999\dots \\ - \quad x = 0.999\dots \\ \hline 9x = 9.000\dots \end{array}$$



Thus $x = 1.000\dots$

The Twelfth Day of Christmas



On the sixth day of Christmas you receive $1+2+3+4+5+6$ presents. A clever way to calculate how many presents you receive on that day is to note that the rectangle above is made up of twice as many circles as there are presents. Therefore you receive $7 \times 6 / 2 = 21$ presents.

How many presents do you receive on the twelfth day of Christmas?"

Ripper

References

B.Polster, Q.E.D.: Beauty in Mathematical Proof, Walker, 2004

R.Nelson, Proofs without Words: Exercises in Visual Thinking, Math. Asso. Amer., 1997.