

Symmetry of Digit "2" In Squaring

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Motivation

God is great, whatever (Air, Water, Earth, Fire & Space) we have it is just because of a Power, which governs the whole universe and more than this Power, it has created human beings, and what we have got or did not get yet, trying to get. The Method, The Principle, The Knowledge or more by which we get or prove in front of World People, basically it is called Science, who GET it, are called Scientists, Mathematicians, Inventors etc i.e. we all breath we all know

but in ancient time we don't know what we breath as the time passes away one man's curiosity bring out the name of gas which we breathe i.e. Oxygen. There are lot examples or more yet to come.

In this regard my little contribution in the field of Mathematics, it starts from my early childhood I used to play with numbers. After a lot of times devoted on numbers one day while squaring 11, 12, 13 so on I found that there is an amazing symmetry of 2 & it's great.

Methodology & Important Findings

If we square 11, it is very simple put $1(2*1)(1^2)$ get 121 same as square 12 put $1(2*2)(2^2)$ get 144 again for 13 we get 169 and for 14 we get $1\ 8\ 16=196$ and so on.

When we go deep, we find that there is symmetry of two types

(2, 4, 6, 8, 10, 12, 14, 16, 18, 20 Diff is always 2) &
(1, 4, 9, 16, 25, 36, 49, 64, 81, 100) diff. is 3 5 7 9 11 13 15 17 19 and diff. of 3 5 7 9 11 always 2, so there is true symmetry .

Up to 19 it is right but at 20 how we can put 1 20 100 just because of symmetry.

- $11^2 = 1\ 2\ 1$
- $12^2 = 1\ 44$
- $13^2 = 1\ 69$
- $14^2 = 1\ 8\ 16 = 100 + 80 + 16 = 196$
- $15^2 = 1\ 1025 = 100 + 100 + 25 = 225$
- $16^2 = 1\ 1236 = 100 + 120 + 36 = 256$
- $17^2 = 1\ 1449 = 100 + 140 + 49 = 289$
- $18^2 = 1\ 16\ 64 = 100 + 160 + 64 = 324$
- $19^2 = 1\ 1881 = 100 + 180 + 81 = 361$
- $20^2 = 1\ 10^2 = 1\ 20100 = 100 + 200 + 100 = 400$
- $21^2 = 1\ 11^2 = 1\ 22\ 121 = 100 + 220 + 121 = 441$
- $22^2 = 1\ 12^2 = 1\ 24\ 144 = 100 + 240 + 144 = 484$
- $23^2 = 1\ 13^2 = 1\ 26\ 169 = 100 + 260 + 169 = 529$

- $24^2 = 1\ 14^2 = 1\ 28\ 196 = 100 + 280 + 196 = 576$
- $25^2 = 1\ 15^2 = 1\ 30\ 225 = 100 + 300 + 225 = 625$
- $26^2 = 1\ 16^2 = 1\ 32\ 256 = 100 + 320 + 256 = 676$
- $27^2 = 1\ 17^2 = 1\ 34\ 289 = 100 + 340 + 289 = 729$
- $28^2 = 1\ 18^2 = 1\ 36\ 324 = 100 + 360 + 324 = 784$
- $29^2 = 1\ 19^2 = 1\ 38\ 361 = 100 + 380 + 361 = 841$
- $30^2 = 1\ 20^2 = 1\ 40\ 400 = 100 + 400 + 400 = 900$

There is a symmetry, from here I got a method, which is shown as below for 31, 41, 51 and so on.

- $31^2 = 1\ 21^2 = 1\ 42\ (1\ 11)^2 = 1\ 42\ (1\ 22\ 121)$
 $= 961 = 121 + 220 + 100$
 $= 441 + 420 + 100 = 961$
- $41^2 = 1\ 31^2 = 1\ 62\ (1\ 21)^2 = 162\ (1\ 42)\ (1\ 11)^2$
 $= 162\ (1\ 42)\ (1\ 22\ 121)$
 $= 1\ 62\ (961) = 961 + 620 + 100 = 1681$
- $51^2 = 1\ 41^2 = 1\ 82\ (1\ 31)^2 = 1\ 82\ (1\ 62)\ (1\ 21)^2$
 $= 182\ (1\ 62)\ (1\ 42)\ (1\ 11)^2$
 $= 1\ 82\ (1\ 62)\ (1\ 42)\ (1\ 22\ 121)$
 $= 1\ 82\ (1681) = 1681 + 820 + 100 = 2601$
- $61^2 = 1\ 51^2 = 1\ 102\ (41)^2 = 1\ 102\ (1\ 82)\ (1\ 31)^2$
 $= 1\ 102\ (1\ 82)\ (1\ 62)\ (1\ 21)^2$
 $= 1\ 102\ (1\ 82)\ (1\ 62)\ (1\ 42)\ (1\ 11)^2$
 $= 1\ 102\ (1\ 82)\ (1\ 62)\ (1\ 42)\ (1\ 22\ 121)$
 $= 1\ 102\ (2601) = 2601 + 1020 + 100 = 3721$
- $71^2 = 1\ 61^2 = 1\ 122\ (1\ 51)^2 = 1\ 122\ (1\ 102)\ (41)^2$
 $= 1\ 122\ (1\ 102)\ (1\ 82)\ (1\ 31)^2 = 1\ 122\ (1\ 102)\ (1\ 82)\ (1\ 62)\ (1\ 21)^2$
 $= 1\ 122\ (1\ 102)\ (1\ 82)\ (1\ 62)\ (1\ 42)\ (1\ 11)^2$
 $= 1\ 122\ (1\ 102)\ (1\ 82)\ (1\ 62)\ (1\ 42)\ (1\ 11)^2$
 $= 1\ 122\ (1\ 102)\ (1\ 82)\ (1\ 62)\ (1\ 42)\ (1\ 22\ 121)$
 $= 3721 + 1220 + 100 = 5041$
- $81^2 = 1\ 71^2 = 1\ 142\ (1\ 61)^2 = 1\ 122\ (1\ 51)^2 = 1\ 122\ (1\ 102)\ (41)^2$
 $= 1\ 122\ (1\ 102)\ (1\ 82)\ (1\ 31)^2 = 1\ 122\ (1\ 102)\ (1\ 82)\ (1\ 62)\ (1\ 21)^2$
 $= 1\ 122\ (1\ 102)\ (1\ 82)\ (1\ 62)\ (1\ 42)\ (1\ 11)^2$
 $= 1\ 122\ (1\ 102)\ (1\ 82)\ (1\ 62)\ (1\ 42)\ (1\ 11)^2$
 $= 1\ 122\ (1\ 102)\ (1\ 82)\ (1\ 62)\ (1\ 42)\ (1\ 22\ 121)$
 $= 5041 + 1420 + 100 = 6561$
- $91^2 = 1\ 81^2 = 1\ 162\ (1\ 71)^2 = 1\ 142\ (1\ 61)^2 = 1\ 122\ (1\ 51)^2$
 $= 1\ 122\ (1\ 102)\ (41)^2 = 1\ 122\ (1\ 102)\ (1\ 82)\ (1\ 31)^2$
 $= 1\ 122\ (1\ 102)\ (1\ 82)\ (1\ 62)\ (1\ 21)^2$
 $= 1\ 122\ (1\ 102)\ (1\ 82)\ (1\ 62)\ (1\ 42)\ (1\ 11)^2$
 $= 1\ 122\ (1\ 102)\ (1\ 82)\ (1\ 62)\ (1\ 42)\ (1\ 11)^2$

$$\begin{aligned}
 &= 1\ 122\ (1\ 102)\ (1\ 82)\ (1\ 62)\ (1\ 42)\ (1\ 22\ 121) \\
 &= 6561 + 1620 + 100 = 8281 \\
 \bullet\ 101^2 &= 1\ 91^2 = 1182(1\ 81^2) = 1\ 162(1\ 71^2) = 1\ 142\ (1\ 61^2) = 1\ 122\ (1\ 51)^2 \\
 &= 1\ 122\ (1\ 102)\ (41)^2 = 1\ 122\ (1\ 102)\ (1\ 82)\ (1\ 31)^2 \\
 &= 1\ 122\ (1\ 102)\ (1\ 82)\ (1\ 62)\ (1\ 21)^2 \\
 &= 1\ 122\ (1\ 102)\ (1\ 82)\ (1\ 62)\ (1\ 42)(1\ 11)^2 \\
 &= 1\ 122\ (1\ 102)\ (1\ 82)\ (1\ 62)\ (1\ 42)\ (1\ 11)^2 \\
 &= 1\ 122\ (1\ 102)\ (1\ 82)\ (1\ 62)\ (1\ 42)\ (1\ 22\ 121) \\
 &= 8281 + 1820 + 100 = 10201
 \end{aligned}$$

About Author

Although PiyushGoel, belongs to a middle class family, he has not left the passion for mathematics and he is well known Independent Researcher and Mathematician in New Delhi

Qualifications: Diploma in Mechanical Engineering, Diploma in Material Management, Diploma in Vastu Shastra,

now a days doing Gita Course(I) from Bhakti Vedanta and very ambitious to join new courses in future (by God Grace).

Mathematics is for him is a passion, due to some family circumstances He could not study higher education, but for him mathematics is mean to lot in my life, whatever he have "Give it to those People who love Mathematics.