Research Journal of Applied Sciences 2 (4): 357-358, 2007

New Performance of Square Numbers II

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Abstract: In the recent study, the new discovery of squaring number was performed. This study is an extension of the study in performing square of numbers be it positive integers or negative integers.

Key words: Square, numbers, positive integers, negative integers, performance

INTRODUCTION

Since the middle of the last century, when number theory began through Pierre-de Fermat (1601-1665). Fermat influence was limited by the lack of interest in publishing the discoveries which are known mainly from letters to friends and marginal notes in the books he read. In 1629, Fermat invented analytic geometry, but mot of the credit went to Descartes; who hurried into print with his own ideas in 1937. Newton acknowledged, in a letter that became known only in 1934, that some of his own early ideas came directly from Fermat. In a series of letters written in 1654, Fermat and Pascal jointly developed the fundamental concepts of the theory of probability.

Contributions to the theory of numbers have interested many researchers; mathematicians of the highest class of old that have contributed original work to number theory that cannot be forgotten. Notable among them are Leonhard Euler (1707-1783), Gabriel Lame' (1795-1870), Godfrey Harold Hardy (1877-1947). Srinivara Ramanuyan (1887-1920), Paul Erdo's (1913-1996) to mention a few.

China discovered a magic square as far back as 200BC, the magic square were subsequently introduced into India, Japan later to Europe (Uko, 1993, 1996).

The research presented in this study is an extension of the study (Akinpelu *et al*., 2005). Here the performance of square of numbers look into in another dimension, different from the one in study (Akinpelu *et al*., 2005).

MATERIALS AND METHODS

Performing the square of a number k shall apply the algorithm below:

Step 1: Brake the number to be squared into sum of two digits

Step 2: Use the Pascal triangle of degree 2. (Binomial expansion of coefficient no.)

Step 3: Sum everything up; It will give the square of the numbers.

Proof:

$K^2 = x$

Let $K = p+q$

$\Rightarrow K^2 = (p+q)^2 = p^2+2pq+q^2$

Since $K^2 = x$

$\therefore K^2 = x = p^2+2pq+q^2$

$\Rightarrow x = p^2+2pq+q^2$ (say)

Hence $K^2 = p^2+2pq+q^2 = x$

NUMERICAL ANALYSIS

Example 1: Find the square of 3.
Illustration of algorithm

Step 1: $3 = 1+2$.

Step 2: $3^2 = (1+2)^2 = (1^2+2(1)(2)+2^2)$

Step 3: $= 1+4+4$

Step 4: $= 9$

Example 2: Performing the square of (-13)

Step 1: $(-13) = (-6+-7)$

Step 2: $(-13)^2 = (-6+-7)^2$

Step 3: $169 = (-6)^2+2(-6)(-7)+(-7)^2$

Step 4: $= 36+84+49$
$= 169$.

Square of three digit numbers: Illustration for squaring of 3 digit numbers.

e.g. $(abc)^2 = (a+x)^2$ where $x = (b+c)$

$$\Rightarrow (abc)^2 = (a+x)^2 = a^2+2ax+x^2$$
$$= a^2+2a(b+c)+(b+c)^2$$
$$= a^2+2ab+2ac+b^2+2bc+c^2$$
$$= a^2+2ab+2ac+2bc+b^2+c^2$$

Example III:

$$(111)^2 = [1+(55+55)] = (1)^2+2(55)+2(55)+2(55)(55)+(55)^2+(55)^2$$
$$= 1+110+110+6050+3{,}025+3{,}025$$
$$= 12{,}321$$

Square of four digit numbers:

e.g. $(1111)^2 = (a+b+c+d)^2 = (x+y)^2$ where $x = a+b$, $y = c+d$.

$$= (111+250+250+500)^2 = x^2+2xy+y^2$$
$$= (a+b)^2+2[(a+b)(c+d)]+(c+d)^2$$
$$= a^2+2ab+b^2+2ac+2ad+2bc+2bd+c^2+2cd+d^2$$
$$= (111)^2+2(111)(250)+(250)^2+2(111)(250)+2(111)(500)+2(250)(250)+2(250)(500)+62{,}500+2(250)(500)+500^2$$
$$= 12{,}321+55{,}500+62{,}500+55{,}500+111{,}000+125{,}000+250{,}000+250{,}000.$$
$$= 1{,}234{,}321$$

CONCLUSION

Based on the example (numerical example), are the proof given. The conclusion can be drawn that, we can get the square of any number be it negative integer or positive integer.

ACKNOWLEDGEMENT

To acknowledge Avoka John of University for Development Studies, Navrongo Campus, for brainstorming with the author. Your contribution is highly acknowledged.

REFERENCES

Akinpelu, F.O., I.A. Adetunde and E.O. Omidiora, 2005. New performance of square of numbers. J. Applied Sci. Environ. Manage., pp: 105-108.

Uko, L.U., 1993. Magic Square and Magic Formulae. The Mathe. Scientist, 18: 67-72.

Uko, L.U., 1996. On a class of Magic Squares. J. Nig. Mathe. Soc., 14/15: 1-9.