

Number Oddities

The following numbers can be elegantly expressed as symmetrical equations using only the digits of the numbers :

$$369 = (3X69) + (36X9) - (3X6X9) \quad 688 = (6X88) + (68X8) - (6X8X8) \quad 639 = (6X39) + (63X9) - (6X3X9)$$

The following simple equations using three two-digit numbers remain still valid when multiplication signs are introduced between the digits of the numbers. Thus, $19 + 37 = 56$ $18 + 39 = 57$ $29 + 38 = 67$

and $(1X9) + (3X7) = (5X6)$ $(1X8) + (3X9) = (5X7)$ $(2X9) + (3X8) = (6X7)$

The simple equation $13^2 = 169$ is still valid when plus signs are introduced between the digits of 13 and 169, $(1 + 3)^2 = 1 + 6 + 9$ Here is a curious coincidence, $2^9 X 9^2 = 2592$

The square number 1089 can be expressed as the difference between the squares of two reversible numbers, $1089 = 65^2 - 56^2$

Interestingly, it can also be expressed as the difference between two squares in two more ways, $1089 = 55^2 - 44^2$ $1089 = 183^2 - 190^2$

The numbers 49 and 1680 are unique in that the addition of 1 to them as well to their halves renders them perfect squares. Thus, $48 + 1 = 49$ $48/2 + 1 = 25$ $1680 + 1 = 1681 = 41^2$ $1680/2 + 1 = 841 = 29^2$

37 is the only two digit number which can be expressed as the difference between the sum of the squares of its digits and the product of its digits, $37 = (3^2 + 7^2) - 3X7$

The palindromes below can be expressed as the difference between the squares of two reversible numbers, $2772 = 96^2 - 68^2$ $5445 = 83^2 - 38^2$ $6336 = 80^2 - 08^2$

Below is an interesting oddity involving the square palindrome 69696. This palindrome can be expressed as the product of two palindromes, namely, $69696 = 6336X11$

The palindrome 6336 is interesting in that it can be represented by a palindromic expression, $6336 = 8X(63+36)X8$

The square palindromes 121, 12321, 1234321, etc., are interesting. When plus signs are introduced between the digits of these numbers they still remain square, though no longer palindromic. Thus, $1 + 2 + 1 = 4$ $1 + 2 + 3 + 2 + 1 = 9$ $1 + 2 + 3 + 4 + 3 + 2 + 1 = 16$.