Vedic Mathematics

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Last Two Classes

- We learnt how to multiply using two sutras namely ekhadhikena Purvena and Nikhilam

In particular, you know what the answers for

39 * 31, 48 * 42, 78 * 82, 6 45 * 6 55

(using ekadhikena sutra) and

53 * 52 , 89 * 92, 104 * 122 (using nikhilam method).

Outline of this class

- How to compute decimal expansions of 1/19, 1/29, …1/89 etc using Ekadhikena Purvena
- Division Using two sutras using nikhilam and urdhva-tiryagbhyam .

How to divide 111 by 89 1234 by 888,

16384 by 128.

Sutra

1. Ekadhikena Purvena

By one more than the previous one.

The preposition “by” means the operations this sutra concerns are either multiplication or division (In the case of addition/subtraction preposition to/from is used.). In this case it is useful for both of them.

Examples

1/ 19 =

1/29 =

What is the method?

Two methods: division and multiplication:

Multiplication: Start with 1 as the last digit.

1

Multiply the last digit by 2 (I.e., one more than 1 (1 being the first digit in 19) and that is the previous digit. 21

Repeat the previous step: 421

Continuing 68421
1

Crucial steps!!

6 8 4 21
1

Multiply 6 by 2 and add 1.

3 6 8 4 2 1
1 1

Continuing we get

4 7 3 6 8 4 2 1
1 1 1

Continue

1/19=. 0 5 2 6 3 1 5 7 8 9 4 7 3 6 8 4 2 1

1/29=

.0 3 4 4 8 2 7 5 8 6 2 0 6 8

9 6 5 5 1 7 2 4 1 3 7 9 3 1

1/39=

Method 2

Division Method for computing 1/19

Divide 1 by 2 (one more than 1 in 1 in 19). Place the quotient in line 1 and reminder in line 2

0 5 2

1 1

Treat the last reminder quotient as one number and divide by 2 and repeat.

Continuing

1/19=

.0 5 2 6 3 1 5 7 8 9 4 7 3 6 8 4 2 1

1/29=

. 0 3 4 4 8 2 7 5 8 6 2 0 6 8 9 6 5 5 1 7 2 4 1 3 7 9 3 1

Divisions

Nikhilam Method:

Examples:

12 / 9 = 1 2

1

1 | 3 Quotient : 1 Reminder: 3

53/9 = 5 3

5 Quotient: 5 Reminder 8

More Examples

What is the quotient and reminder when 12031 is divided by 9?

1 2 0 3 1

1 3 3 6

Quotient is 1 3 3 6 Reminder 7

More Examples

1 8 over 9

225 over 9

136 over 9

237 over 9

Examples

1011649 divided by 9

111/89

1234 / 888

111/73