VEDIC MATHS

Vedic Math's:

- **Multiplication & Division with powers of 5**
- **Multiplication with series of 9s**
- **Multiplication of 2-digit and 3-digit numbers**
- **Squares of 2-digit numbers: Base Value & Face Value Method**
- **Square root**
- **Cubes**
- **Cube root**

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MULTIPICATION & DIVISION

■ MULTIPLICATION BY 5, 25,125

1. for 5, multiply number by 10 and divide by 2

2. for 25, multiply number by 100 and divide by 4

3. for 125, multiply number by 1000 and divide by 8.

■ DIVISION BY 5, 25, 125

1. for 5, multiply number by 2 and divide by 10.

2. for 25, multiply number by 4 and divide by 100.

3. for 125, multiply number by 8 and divide by 1000.

APPLICATIONS

1. **Find the product 36 x 25?**

A) 935   B) 765   C) 900   D) 245

2. **Find the value of 124*125?**

A) 13400   B) 14500   C) 15500   D) 18750

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APPLICATIONS

3. Find the value of 1500 / 125?

A) 11   B) 8   C) 12   D) 14

4. Find the value of 147 / 25?

A) 6.98   B) 6.88   C) 5.89   D) 5.88

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MULTIPLICATION OF NUMBERS WITH 11

To multiply any number with 11

Step 1:- Write the last digit as it is

Step 2:- Add last digit to next digit and write the unit digit as it is and carry forward rest and so on

Step 3:- Write the last digit as it is

For example :- 23*11

Step 1:- Keep last digit as 1

Step 2:- Add 3+2 =5

Step 3:- Write starting digit as 2

So answer will be 253

APPLICATIONS

5.Find the value of 79*11?

  A) 869   B) 789   C) 909   D) 809

6.Find the value of 123*111?

  A) 13633   B) 13653   C) 13333   D) 12933

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APPLICATIONS

7. Find the value of 249*11?

A)2759   B) 2739   C) 2699   D) 2679

8.Find the value of 849*11?

A) 9289   B) 9319   C) 9329   D) 9339

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MULTIPLICATION OF NUMBERS WITH 9,99 & 999…

To multiply any number with 9,99 & 999…

Step 1:- Write number of zeroes equal to number of 9s on the right hand side of the number to be multiplied

Step 2:- Now subtract the number to be multiplied from this number

For example:- 8*9

Step 1 :- Write one zero with 8 to make the number as 80

Step 2 :- Now subtract 8 from 80 i.e 80-8 = 72

So 8*9 = 72

APPLICATIONS

9.Find the value of 257*9?

A) 2353   B) 2303   C) 2313   D) 2363

10.Find the value of 58*99?

A) 5632   B) 6182   C) 6822   D) 5742

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APPLICATIONS

11. Find the value of 436*99?

A)39452	B) 43164	C) 44724	D) 42492

12. Find the value of 689*999?

A)687431	B) 688411	C) 688311	D) 688321

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MULTIPLICATION OF TWO DIGIT NUMBERS
(CRISS CROSS METHOD)

Step 1:- First of all multiply the last digits and keep the unit digit only and carry forward rest

Step 2:- Now cross multiply the digits and again keep the unit digit only
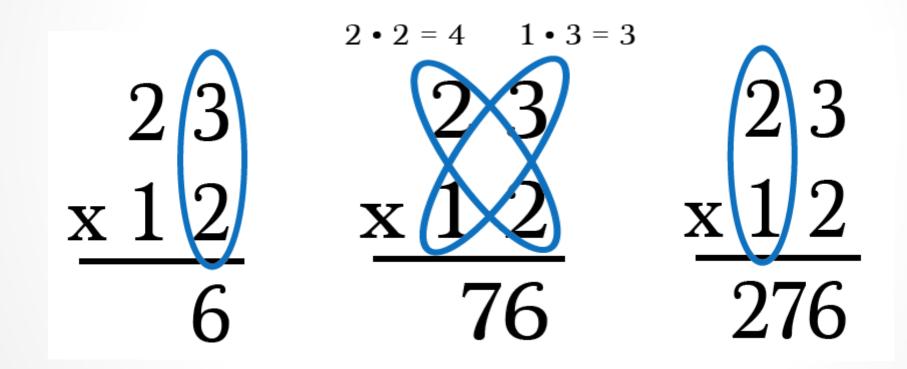
Step 3:- Now again multiply the starting digits.

It is shown on the next slide with an example

(CRISS CROSS METHOD)
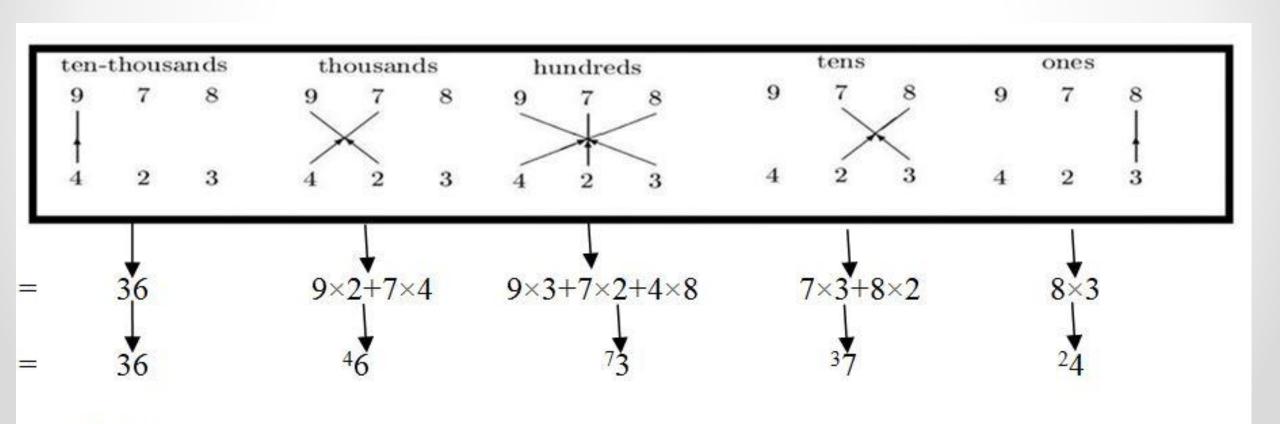
MULTIPLICATION OF THREE DIGIT NUMBERS

(CRISS CROSS METHOD)

Multiplication of three digit numbers are explained in the given steps

$= 36 \quad 9\times2+7\times4 \quad 9\times3+7\times2+4\times8 \quad 7\times3+8\times2 \quad 8\times3$

$= 36 \quad {}^46 \quad {}^73 \quad {}^37 \quad {}^24$

$= 413694$

APPLICATIONS

13.Find the value of 85*46?

A) 3910   B) 4112   C) 4052   D) 4132

14.Find the value of 42*48?

A) 2026   B) 2096   C) 2016   D) 2116

APPLICATIONS

15. Find the value of 237*314?

A) 80228　　　　　B) 80178　　　　　C) 80128　　　　　D) 74418

16. Find the value of 786*549?

A) 431574　　　　　B) 431514　　　　　C) 431534　　　　　D) 431554

SQUARE

For Squares of 2-digit numbers

Using Base value

Take base as 40.

So, square will be $= (44+4)*40 + 4^2 = 1920+16 = 1936$

Using Face Value Method

we can use the formula to calculate the square of any two digit number

$(ab)^2 = a^2 \mid 2*a*b \mid b^2$

SHORTCUT METHOD FOR FINDING SQUARES:

So, according to this method Square of any number

(If **Number >Base value**)= [(Number+(number - base value)]×Base value+(Number - Base value)^2

(If **Base value >Number**) = [(Number-(base value - number)] ×Base value+(Base value - Number)^2

1. FOR BASE VALUE 100

(i)To find the square of 106

As 106 = 100+6

Lets take the base value as 100

So, the square of 106 = (106+6)×Base+6^2

= 11200+36= 11236

2. BASE SQUARE 200

To find the square of 206.

As, $206^2 = (200+6)^2$

the square will be= $(206+6) \times 200 + 6^2$

$= 42400+36 = 42436$

3. FOR BASE SQUARES 50

find the square of 41?

As $41 = 50 - 9$

So, the square will be $= (41-9) \times 50 + 9^2$

$= 1600 + 81 = 1681$ Ans.

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SHORTCUT METHOD FOR FINDING SQUARES:

4. ANY OTHER BASE VALUE

(i) To find the square of 76

As, 76= 70+6

So , square of number = $(76+6) \times 70 + 6^2$

=5740+36 = 5776

(ii) To find the square of 145

As 145=150-5

So, square of number = $(145-5) \times 150 + 5^2$

SQUARE

For Squares of three digit numbers

Select any number from 100-999 :- (588)^2

Step 1:- Take the difference of this number and the nearest number ending with zero. Lets take that number be 600, so difference will be 600-588 = 12

Step 2:- Take square of this difference and that will be 12^2 = 144

Step 3:- Now first add and then subtract the difference from step 1. i.e. 600 and 576

Step 4:- multiply 600 and 576 and then add 144(from step 2) in the result, so it will become (588)^2 = 576*600 + 144 = 345600+144 = 345744

OR

Using Base value

As 588=600-12, so take the base value as 600.

So, square of the number will be= $(588-12)*600 + 12^2 = 345600+144 = 345744$

SQUARE OF NUMBERS ENDING WITH 5

$$45^2 = 2025$$

step 1 - multiply the first digit by the first digit plus one

$$4 \times (4+1) = 20$$

Step 2 - write the number 25 next to the result from step 1

$$20\_25$$

APPLICATIONS

17.Find the square of 46?

A) 2116   B) 2378   C) 2216   D) 2316

18.Find the square of 396?

A) 156216   B) 156816   C) 152664   D) 161664

19.Find the square of 112?

A) 11544   B) 12544   C) 11344   D) 12444

SQUARE ROOT SHORTCUTS
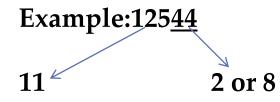
(For Perfect Square Numbers Only)

Step 1: Check unit digit of the no. (in pair).

Step 2: Select whose square less than remaining no.

Step 3: Multiply no. with consecutively next no.

Step 4: Compare & select

Number	Square	Last digit
1	1	1
2	4	4
3	9	9
4	16	6
5	25	5
6	36	6
7	49	9
8	64	4
9	81	1

Example:12544

11   2 or 8

$11^2 < 125 < 12^2$

Now, 11*12 = 132

125<132; So, we'll choose the smaller number i.e. 11.

Answer will be 112

APPLICATIONS

20.Find the square root of 14641?

A) 121   B) 91   C) 111   D) 141

21.Find the square root of 233289?

A) 587   B) 377   C) 483   D) 733

APPLICATIONS

22. Find the square root of 19321?

A) 141   B) 149   C) 139   D) 131

23. Find the square root of 17424?
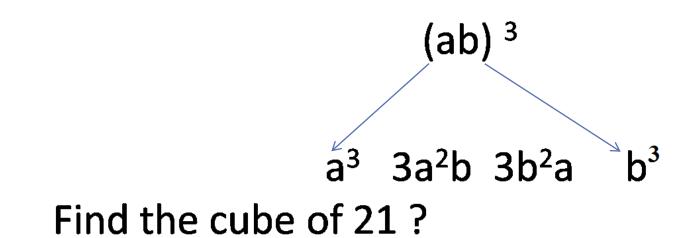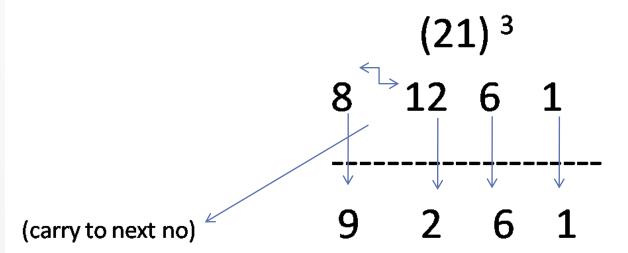
A) 132   B) 128   C) 142   D) 148

$(ab)^3$

$a^3 \quad 3a^2b \quad 3b^2a \quad b^3$

Find the cube of 21 ?

$(21)^3$

8   12   6   1

(carry to next no)   9   2   6   1

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APPLICATIONS

24. Find the Cube of 17?

a) 4179   B) 4963   C) 3821   D) 4913

25. Find the Cube of 24?

A) 14178   B) 14964   C) 13824   D) 13148

26. Find the Cube of 73?
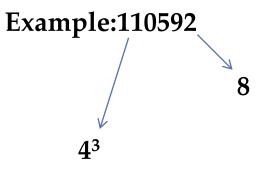
A) 384131   B) 389017   C) 413141   D) 361487

CUBE ROOT SHORTCUTS

Step 1: Check unit digit and write its corresponding last digit number

Step 2: Ignore the last three digits

Step 3:Select whose cube is less than or equal to the remaining digit.

Step 4: Write that number with the corresponding number

Number	Cube	Last digit
1	1	1
2	8	8
3	27	7
4	64	4
5	125	5
6	216	6
7	343	3
8	512	2
9	729	9

Example:110592

8

4^3

Now, 48 will be the answer

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APPLICATIONS

27. Find the cube root of 5832?

A) 14   B) 18   C) 16   D) 22

28. Find the cube root of 24389?

A) 33   B) 43   C) 23   D) 29

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APPLICATIONS

29.Find the cube root of 13824?

A) 28   B) 34   C) 14   D) 24

30.Find the cube root of 157464?

A) 52   B) 48   C) 54   D) 58