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Calculation Techniques

Vedic Maths is a collection of techniques/formula solving mathematical problem sets in a fast and easy way.

वैदिक गणित, गणितीय समस्याओं को तेज और आसान तरीके से हल करने के लिए तकनीकों/सूत्रों का एक संग्रह है।

Basic Calculation Tricks (बुनियादी गणना की ट्रिक्स):-

- Addition Tricks (जोड़ने की ट्रिक्स)
- Subtraction Tricks (घटाने की ट्रिक्स)
- Multiplication Tricks (गुणा करने की ट्रिक्स)
- Division (विभाजन)

Addition Tricks (जोड़ने की ट्रिक्स)

Method :- 1

Step 1 :- Find out the number which is closest to the 10s multiple because it is easier to add those numbers.

उस संख्या का पता लगाएं जो 10 के गुणज के सबसे करीब है क्योंकि उन संख्याओं को जोड़ना आसान है।

i.e. 7, 8, 9 close to 10 / यानी 7, 8, 9, 10 के करीब
21, 22, 23 close to 20 / 21, 22, 23, 20 के करीब
67, 68, 69, close to 70 / 67, 68, 69, 70 के करीब
97, 98, 99, close to 100 and so on. / 97, 98, 99, 100 के करीब..... इत्यादि।

Step 2 :- Add the numbers which are the multiples of 10s
उन संख्याओं को जोड़ें जो 10 के गुणज हैं।

Step 3 :- Add/Subtract the deficiency of numbers.
संख्याओं की कमी को जोड़ें/घटाएँ।

Example :- Add 38 and 97.
38 और 97 जोड़ें।

Solution :-

Step 1 :- 38 and 97 are closer to 40 and 100 respectively.

Step 2 :- Add 40 and 100 = 140

Step 3 :- Both numbers have deficiency of 2 and 3 respectively.

So, $140 - 5 = 135$

Example:- Use the trick to add 48 and 89:
48 और 89 को जोड़ने के लिए ट्रिक्स का उपयोग करें:

(a) 137 (b) 127 (c) 147 (d) 139

Your Turn :- Sol.1.(a)

Example :- Add 82 and 167.
82 और 167 जोड़ें।

Solution :-

Step 1 :- 82 and 167 are closer to 80 and 170 respectively.

Step 2 :- Add 80 and 170

Step 3 :- 82 has 2 extra and 167 has 3 deficiency.

So $250 + 2 - 3 = 249$

Example:- Add 72 and 58 using this trick:

इस ट्रिक्स का उपयोग करके 72 और 58 को जोड़ें:

(a) 120 (b) 130 (c) 140 (d) 128

Your Turn :- Sol.(b)

Example :- Add 146 and 467.

146 और 467 जोड़ें।

Solution :-

Step 1 :- 146 and 467 are closer to 150 and 470 respectively.

Step 2 :- Add 150 and 470

Step 3 :- Both numbers have deficiency of 4 and 3 respectively.

So $620 - 7 = 613$

Example:- What is the total of 456 + 321 ?

456 + 321 का कुल योग क्या है?

(a) 777 (b) 767 (c) 787 (d) 677

Your Turn :- Sol.(a)

Method :- 2

Add ones with ones, tens with tens, hundreds with hundreds, thousand with thousand, and so on.

इकाई को इकाई के साथ जोड़ें, दहाई को दहाई के साथ जोड़ें, सैकड़ों को सैकड़ों के साथ जोड़ें, हजार को हजार के साथ जोड़ें, इत्यादि।

Example :- $357 + 576 + 457$

Solution :-

$(300 + 500 + 400) + (50 + 70 + 50) + (7 + 6 + 7) = 1200 + 170 + 20$
Hundredth place Tens place Ones place 1390

Example:- Add $245 + 534 + 385$ using the trick:

ट्रिक्स का उपयोग करके $245 + 534 + 385$ को जोड़ें :-

(a) 1444 (b) 1224 (c) 1064 (d) 1164

Your Turn :- Sol.(d)

Method :- 3

Addition When numbers are close to each other (एक दूसरे के करीब वाली संख्याओं को जोड़ने पर):-

Step 1 :- Double the smaller number.

छोटी संख्या को दोगुना करें।

Step 2 :- Find the gap between the original number.

मूल संख्या के बीच का अंतर ज्ञात करें।

Step 3 :- Now add both the results.

अब दोनों परिणाम जोड़ें।

Example:- $63 + 71$

Solution:-

Step 1 :- double the smaller number i.e. $63 \times 2 = 126$

Step 2 :- gap between the original number i.e. $71 - 63 = 8$

Step 3 :- Add both the results i.e. $126 + 8 = 134$

Example:- $84 + 92 = ?$

(a) 176 (b) 166 (c) 186 (d) 174

Your Turn :- Sol.(a)

Example :- $615 + 632$

Solution:-

Step 1 :- double the smaller number i.e. $615 \times 2 = 1230$

Step 2 :- gap between the original number i.e. $632 - 615 = 17$

Step 3 :- add both the results i.e. $1230 + 17 = 1247$

Example:- $412 + 420 = ?$

(a) 832 (b) 842 (c) 822 (d) 812

Your Turn :- Sol.(a)

Subtraction Tricks (घटाने की ट्रिक्स)**Method :- 1**

Example :- $357 + 576 - 475$

Solution:-

$(300 + 500 - 400) + (50 + 70 - 70) + (7 + 6 - 5) = 400 + 50 + 8$

 Hundredth place Tens place Ones place 458

Example:- What is the value of $289 + 658 - 342$?

$289 + 658 - 342$ का मान क्या है?

(a) 505 (b) 605 (c) 400 (d) 615

Your Turn :- Sol.(b)

Method :- 2

When double digit subtracted from its reversed number (जब दो अंकों वाली संख्या को उसके उलटे अंकों वाली संख्या से घटाया जाए) :-

Step 1 :- Find the difference between the digits.

अंकों के बीच अंतर ज्ञात करें।

Step 2 :- multiply the difference by 9

अंतर को 9 से गुणा करें

Example :- $63 - 36 = ?$

Solution :-

Step 1 :- Find the difference between the digits i.e. $6 - 3 = 3$

Step 2 :- Multiply the difference by 9 i.e. $3 \times 9 = 27$

Example :- What is the value of $83 - 38$?

$83 - 38$ का मान क्या है?

(a) 54 (b) 45 (c) 36 (d) 63

Your Turn :- Sol.(b)

Multiplication Tricks (गुणा करने की ट्रिक्स)

Multiplication tricks are divided into the following categories
 गुणा (Multiplication) की ट्रिक्स को निम्नलिखित श्रेणियों में विभाजित किया गया है :-

- For 2 digit Multiplications
- For 3 digit Multiplications
- Multiplying numbers which are close to powers of 10
- Multiplication with 5, 25, 125, 625
- Multiplying by 101 or 1001
- Multiplying an even number by a decimal number which is a multiple of 5
- Multiplication of an even number by 15
- Multiplying a number with twice of itself

(a) For 2 digit Multiplications (2 अंकीय गुणन के लिए):-

Method :- 1

Example :- 81×92

Solution :-

Step 1 :- Multiplying vertically the units place

$$\begin{array}{r} 8 \mid 1 \uparrow \\ \times 9 \mid 2 \\ \hline 2 \end{array}$$

$$\begin{array}{r} 9 \times 252 \\ \hline 2268 \end{array}$$

$\begin{array}{r} 8 \quad 1 \\ \times 9 \quad 2 \\ \hline 7452 \end{array}$

Diagram illustrating the addition of 615 and 410 using a lattice method. The numbers are written in a grid. Arrows show the addition of digits from right to left, with a carry of 1 from the tens place to the hundreds place. The result is 800.

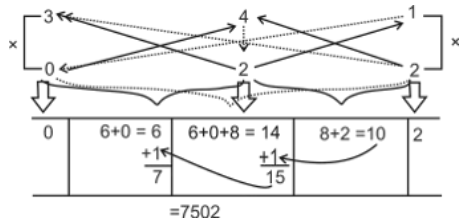
Diagram illustrating the distributive property of multiplication over addition. It shows 3 tens and 6 ones multiplied by 7 tens and 4 ones. The calculation is broken down into three parts: 3 tens times 7 tens equals 21 hundreds; 3 tens times 4 ones equals 12 tens; and 6 ones times 7 tens equals 42 tens. These are then summed to get the final product of 2664.

$$\begin{array}{r} \uparrow \quad 2 \quad \swarrow \quad 9 \quad \uparrow \\ \times 8 \quad \nwarrow \quad 1 \\ \hline 2349 \end{array}$$

3

Example :- 341×22

Solution :-



Example :- What is the value of 24×112 ?

24×112 का मान क्या है?

- (a) 2688 (b) 2648 (c) 2588 (d) 3688

Your Turn :- Sol.(a)

Method :- 2

Multiplication of Two Numbers in which one Number Contains only 9 (दो संख्याओं का गुणन जिसमें एक संख्या में केवल 9 होता है):-

Step 1 :- The number being multiplied by 9's is first reduced by 1 and that result will be the 1st part.

9 से गुणा की जाने वाली संख्या को पहले 1 से घटाया जाता है और वह परिणाम पहला भाग होगा।

Step 2 :- subtract the resultant from the number consisting of 9.

9 से बनी संख्या से परिणाम घटाएं।

Step 3 :- combine both the numbers.

दोनों संख्याओं को मिलाएं।

Example :- $423 \times 999 = ?$

Solution :-

Step 1 :- The number being multiplied by 9's is first reduced by 1 and that result will be the 1st part i.e. $423 - 1 = 422$

जिस संख्या को 9 से गुणा किया जा रहा है उसे पहले 1 से घटाया जाता है और परिणाम पहला भाग होगा यानी $423 - 1 = 422$

Step 2 :- subtract the resultant from number consist of 9 i.e. $999 - 422 = 577$

9 से बनी संख्या से परिणाम घटाएं यानी $999 - 422 = 577$

Step 3 :- combine both the numbers i.e. 422,577

दोनों संख्याओं यानी 422,577 को मिलाएं

Example:- $567 \times 999 = ?$

- (a) 566433 (b) 567433 (c) 565433 (d) 566333

Your Turn :- Sol.(a)

Example:- $84 \times 99 = ?$

- (a) 8416 (b) 8316 (c) 8216 (d) 8326

Your Turn :- Sol.(b)

Method :- 3

Multiplying 2 three digit number having zero between them तीन अंकों की दो संख्याओं को गुणा करना जिनके बीच शून्य है

Example :- $203 \times 809 = ?$

Solution :- $2 \times 8 = 16$, $2(9) + 3(8) = 42$, $3 \times 9 = 27$

Now, combining all three outcomes, we get : 164227

Example:- $405 \times 607 = ?$

- (a) 245835 (b) 244835 (c) 255835 (d) 246835

Your Turn :- Sol.(a)

Example:- $308 \times 504 = ?$

- (a) 154232 (b) 156232 (c) 155232 (d) 145232

Your Turn :- Sol.(c)

(c) Multiplying numbers which are close to powers of 10
उन संख्याओं को गुणा करना जो 10 की घात के करीब हों :-

Step 1 :- Find how much the number is more or less than the power of 10 and write it on the right side of the vertical line.

ज्ञात करें कि कोई संख्या 10 की घात से कितनी अधिक या कम है और इसे ऊर्ध्वाधर रेखा के दाईं ओर लिखें।

Step 2 :- Either cross subtract or cross add. This will form the first part of the final answer.

या तो क्रॉस घटाएँ या क्रॉस जोड़ें। यह अंतिम उत्तर का पहला भाग बनेगा।

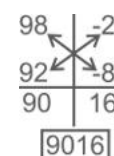
Step 3 :- Multiply the right side of the vertical line and this shall form the right side of the result.

ऊर्ध्वाधर रेखा के दाईं ओर को गुणा करें और यह परिणाम का बयां हिस्सा बन जाएगा।

(i). Here base is 100 (यहां आधार 100 है)

Example :- $98 \times 92 = ?$

Solution :-



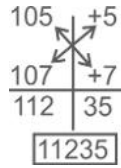
Example:- $94 \times 97 = ?$

- (a) 9018 (b) 9118 (c) 9218 (d) 9128

Your Turn :- Sol.(b)

Example :- 105×107

Solution :-

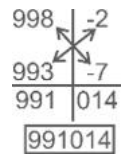


Example :- $106 \times 108 = ?$

- (a) 11448 (b) 11248 (c) 11348 (d) 11548

Your Turn :- Sol.(a)

(ii). Here base is 1000. (यहाँ आधार 1000 है)



Example:- $996 \times 994 = ?$

- (a) 980024 (b) 992124 (c) 990024 (d) 981026

Your Turn :- Sol.(c)

(d) Multiplication with 5, 25, 125, 625
5, 25, 125, 625 से गुणा

$$5 \rightarrow \frac{10}{2}, 25 \rightarrow \frac{100}{4}, 125 \rightarrow \frac{1000}{8}, 625 \rightarrow \frac{10000}{16}$$

(i). Multiplication of a Number by 5 (5 से गुणा करने पर)

$$N \times 5 \text{ means } N \times \frac{10}{2}$$

$$36 \times 5 = 36 \times \frac{10}{2} = 180$$

$$78 \times 5 = 78 \times \frac{10}{2} = 390$$

$$128 \times 5 = 128 \times \frac{10}{2} = 640$$

$$946 \times 5 = 946 \times \frac{10}{2} = 4730$$

Example:- $136 \times 5 = ?$

- (a) 660 (b) 680 (c) 780 (d) 580

Your Turn :- Sol.(b)

(ii). Multiplication of a Number by 25
(किसी संख्या को 25 से गुणा करना)

$$\text{As we know that } 25 = \frac{100}{4}$$

Step 1 :- Divide the number by 4

संख्या को 4 से विभाजित करें

Step 2 :- Use (00) with the result .

परिणामी के साथ (00) का प्रयोग करें।

Example :- Find 748×25

748×25 का मान ज्ञात कीजिए ?

Solution:-

Step 1 :- Divide the number by 4 $\Rightarrow \frac{748}{4} = 187$

Step 2 :- Use (00) with the resultant $\Rightarrow 18700$

Example :- $84 \times 25 = ?$

- (a) 2200 (b) 2100 (c) 2000 (d) 2400

Your Turn :- Sol.(b)

(iii). Multiplication of a Number by 125
(125 से गुणा करने पर)

$$N \times 125 \text{ means } N \times \frac{1000}{8}$$

$$64 \times 125 = 64 \times \frac{1000}{8} = 8000$$

$$512 \times 125 = 512 \times \frac{1000}{8} = 64000$$

$$48 \times 125 = 48 \times \frac{1000}{8} = 6000$$

Example :- $84 \times 125 = ?$

- (a) 12525 (b) 9500 (c) 10605 (d) 10500

Your Turn :- Sol.(d)

(iv). Multiplication of a Number by 625
(किसी संख्या को 625 से गुणा करना)

$$N \times 625 \text{ Means by } N \times \frac{10000}{16}$$

$$64 \times 625 = 64 \times \frac{10000}{16} = 40,000$$

$$80 \times 625 = 80 \times \frac{10000}{16} = 50,000$$

Example:- $84 \times 625 = ?$

- (a) 42500 (b) 52505 (c) 52500 (d) 12500

Your Turn :- Sol.(c)

(e) Multiplying by 101 or 1001
(101 और 1001 से गुणा करने पर)

$$42 \times 101 = 4242$$

$$53 \times 101 = 5353$$

$$87 \times 1001 = 87087$$

$$92 \times 1001 = 92092$$

$$123 \times 1001 = 123123$$

$$456 \times 1001 = 456456$$

Example:- $67 \times 101 = ?$

- (a) 6707 (b) 6767 (c) 6067 (d) 6776

Your Turn :- Sol.(b)

Example:- $345 \times 1001 = ?$

- (a) 345045 (b) 345345 (c) 340345 (d) 305345

Your Turn :- Sol.(b)

(f) Multiplying an even number by a decimal number which is a multiple of 5 (एक सम संख्या को एक दशमलव संख्या से गुणा करना जो कि 5 का गुणज है।) :-

$$54 \times 1.5 = 54 \times \frac{3}{2} = 81$$

$$42 \times 2.5 = 42 \times \frac{5}{2} = 105$$

$$86 \times 3.5 = 86 \times \frac{7}{2} = 43 \times 7 = 301$$

$$44 \times 4.5 = 44 \times \frac{9}{2} = 198$$

(g) Multiplication of an even number by 15
(सम संख्या को 15 से गुणा करने पर)

$$N \times 15 \Rightarrow (\text{adding } N \text{ to half of itself}) \times 10$$

$$N \times 15 \Rightarrow (\text{स्वयं के आधे भाग में } N \text{ जोड़ना}) \times 10$$

$$56 \times 15 \Rightarrow (56 + 28) \times 10 = 840$$

$$78 \times 15 \Rightarrow (78 + 39) \times 10 = 1170$$

Example :- $46 \times 15 = ?$

- (a) 680 (b) 690 (c) 790 (d) 590

Your Turn :- Sol.(b)

Example :- Solve 82×15 : / 82×15 को हल करें:

- (a) 1130 (b) 1330 (c) 1230 (d) 1240

Your Turn :- Sol.(c)

(h) Multiplying a number with twice of itself
(किसी संख्या को उसी के दोगुने से गुणा करना)

$$N \times 2N = 2N^2$$

$$17 \times 34 = 2(17)^2 = 2(289) = 578$$

$$21 \times 42 = 2(21)^2 = 2(441) = 882$$

Example :- Solve 27×54 :

27×54 को हल करें:

- (a) 1448 (b) 1458 (c) 1474 (d) 1154

Your Turn :- Sol.(b)

Division (विभाजन)

Division tricks are divided into the following categories :-

- Division with same double digit number (11, 22, 33, 44 etc)
- Division of number with 25
- Division of number with 5
- Division of number with 0.125
- Division of number with 9, 99, 999

(a) Division with same double digit number (11, 22, 33, 44 etc) समान दोहरे अंक वाली संख्या (11, 22, 33, 44 आदि) से विभाजन

In this type of division, the number are like when we add first and last digit of the number, we get the middle number
 इस प्रकार के विभाजन में, संख्याएँ इस प्रकार होती हैं जैसे जब हम संख्या का पहला और अंतिम अंक जोड़ते हैं, तो हमें मध्य अंक प्राप्त होती है

i.e $792 (7 + 2) = 9$

Example :- Find $792 \div 55$

Solution:-

Pick the first and last digit of the number and divide by 5
 संख्या का पहला और अंतिम अंक चुनें और उसे 5 से भाग दें

$$\frac{72}{5} = 14.4$$

Example:- $396 \div 33 = ?$

- (a) 11 (b) 12 (c) 13 (d) 14

Your Turn :-Sol.(b)

Example :- Find $682 \div 77$

Solution :- $\frac{62}{7} = 8.85$

Example :- What will be the value of $891 \div 99$?

891 ÷ 99 का मान क्या होगा ?

- (a) 8 (b) 9 (c) 11 (d) 10

Your Turn :- Sol.(b)

(b) Division of number with 25
किसी संख्या का 25 से विभाजन

As we know that , $25 = \frac{100}{4}$

Example :- Find $35 \div 25$

Solution:- Just 4 time the given number and place decimal after 2 place from the right hand side

दी गई संख्या का 4 गुना करें और दाहिनी ओर से 2 स्थान के बाद दशमलव लगाए ।

$$35 \times 4 = 140 = 1.4$$

Example:- $41 \div 25 = ?$

- (a) 1.54 (b) 1.46 (c) 1.24 (d) 1.64

Your Turn :- Sol.(d)

Example :- Find $354 \div 25$

Solution:- Just 4 time the given number and place decimal after 2 place from the right hand side

$$354 \times 4 = 1416 = 14.16$$

Example :- Solve $612 \div 25$ without long division:

बिना लंबी भाग विधि (long division) के $612 \div 25$ को हल करें:

- (a) 24.48 (b) 25.48 (c) 23.48 (d) 24.84

Your Turn :- Sol.(a)

(c) Division of number with 5
किसी संख्या का 5 से विभाजन

As we know that $5 = \frac{10}{2}$

Example :- Find $47 \div 5$?

Solution :- Double the number and place the decimal after one place from the right hand side .

$$47 \times 2 = 94 = 9.4$$

Example:- Solve $69 \div 5$ using the trick:

ट्रिक का उपयोग करके $69 \div 5$ को हल करें:

- (a) 13.8 (b) 12.9 (c) 12.8 (d) 11.9

Your Turn :- Sol.(a)

Example :- Find $576 \div 5$?

Solution:- Double the number and place the decimal after one place from the right hand side .

$$576 \times 2 = 1152 = 115.2$$

Example :- Solve $234 \div 5$ using the trick:

ट्रिक का उपयोग करके $234 \div 5$ को हल करें:

- (a) 45.8 (b) 46.8 (c) 47.8 (d) 48.6

Your Turn :- Sol.(b)

(d) Division of number with 0.125
किसी संख्या का 0.125 विभाजन से

As we know that $0.125 = \frac{1}{8}$

Example :- Find $235 \div 0.125$

Solution :- Just 8 times the given number

$$235 \times 8 = 1880$$

Example :- What is the value of $242 \div 0.125$?

$242 \div 0.125$ का मान क्या है?

- (a) 1436 (b) 1632 (c) 1936 (d) 1826

Your Turn :- Sol.(c)

Example :- $65 \div 0.125 = ?$

- (a) 510 (b) 520 (c) 530 (d) 540

Your Turn :- Sol.(b)

(e) Division of number with 9 , 99 , 999
किसी भी संख्या का 9 , 99 , 999 ... से विभाजन

- If there is one 9 and there is one digit in the given number.

यदि दी गई संख्या में एक 9 और एक अंक है .

Example :- Find $(4 \div 9) = 0.44444.....$

- If there are two 9 and there are two digits in the given

number.

यदि दी गई संख्या में दो 9 और दो अंक हो

Example :- $7 \div 9 = ?$

(a) 0.666 (b) 0.777 (c) 0.888 (d) 0.7979

Your Turn :- Sol.(b)

Example :- Find $53 \div 99 = 0.535353.....$

Example :- Choose the correct value of $41 \div 99$:

(a) 0.4141 (b) 0.4111 (c) 0.1414 (d) 0.4411

Your Turn :- Sol.(a)

- If there are three 9 and two digits in the given number.
यदि दी गई संख्या में तीन 9 और दो अंक हो।

Example :- $76 \div 999 = 0.076076076.....$

Example :- $85 \div 999 = ?$

(a) 0.185 (b) 1.085 (c) 0.065 (d) 0.085

Your Turn :- Sol.(d)

Smart Notes Space:-



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The following are some effective ways to make calculations simpler and faster

(गणना को सरल और तेज़ बनाने के कुछ प्रभावी तरीके निम्नलिखित हैं) :-

- What are the Square / वर्ग क्या होता है
- Tricks for Finding a Square / वर्ग ज्ञात करने की ट्रिक
- What is the Square Root / वर्गमूल क्या होता है ?
- Methods of Finding Square root Decimal Numbers / दशमलव संख्याओं का वर्गमूल ज्ञात करने की विधियाँ
- Identifying Perfect Squares and Irrational Roots / पूर्ण वर्गों और अपरिमित मूलों की पहचान करना
- Properties of Perfect Squares and Square Roots / पूर्ण वर्ग एवं वर्गमूल के गुण
- Square Mirrors / वर्ग दर्पण
- What are Cube / घन क्या होता है
- Trick to finding the Cube / घन ज्ञात करने की ट्रिक
- What is the Cube Root / घनमूल क्या होते हैं?
- Methods of Finding Cube Root / घनमूल ज्ञात करने की विधियाँ
- Making a Perfect Square/Cube / एक पूर्ण वर्ग/घन बनाना
- Square Arrangement / वर्ग व्यवस्था

What is the Square (वर्ग क्या होता है)

The square of a number is a value which is produced when a number is multiplied by itself.

किसी संख्या का वर्ग वह मान होता है जो उस संख्या को स्वयं से गुणा करने पर प्राप्त होता है।

$$a \times a = a^2$$

If , number = a

then, square = a^2

i.e. the square of 5, denoted as 5^2 , is 25, because when we multiply 5 by itself we get $5 \times 5 = 25$.

5 का वर्ग, जिसे 5^2 के रूप में दर्शाया गया है, 25 है, क्योंकि जब हम 5 को स्वयं से गुणा करते हैं तो हमें $5 \times 5 = 25$ प्राप्त होता है।

Tricks for Finding a Square

(वर्ग ज्ञात करने की ट्रिक)

- Square of Numbers with Unit Digit 5