

-VEDIC MATHS-

UNIT -1

* Addition

i) Addition with any 10 Consecutive No

a) 72 to 81
= 765

- 1) Just take smallest No = 72
- 2) Add 4 = $72 + 4 = 76$
- 3) Just add 5 at the end of No
765

b) 121 to 130

$121 + 4 = 125$
= 1255

c) -321 to -330

Smallest No = -330

Add 4 = $-330 + 4 = -326$

Just add 5 at the end of No.

-3265

2] Addition with 1st odd No [N^2]

eg-

① - First 61 odd No
 $N^2 = 61^2 = \underline{3721}$

② First 85 odd No
 $N^2 = 85^2 = \underline{7225}$

3] Addition with 1st even No. $[n(n+1)]$

eg -

$$\begin{aligned} 1] \text{ 1st 56 even No} \\ n(n+1) &= 56(56+1) \\ &= 56 \times 57 \\ &= \underline{\underline{3192}} \end{aligned}$$

$$\begin{aligned} 2] \text{ 1st 82 even No} &= n(n+1) \\ &= 82(82+1) \\ &= 82 \times 83 \\ &= \underline{\underline{6806}} \end{aligned}$$

★ Addition with Dashkam Method [Rapid add]

$$\begin{array}{r} 2 \ 2 \ 1 \\ 3 \ 9 \cdot 2 \ 6 \\ 4 \ 8 \ 9 \cdot 1 \\ 3 \cdot 2 \cdot 6 \ 1 \\ 9 \cdot 3 \ 8 \cdot 2 \\ \hline 21470 \end{array}$$

- Do addition from unit digit No
- give dot whenever addition is 10 or above 10.
- If your addition is above 10 like -13 So give 1 dot for 10 and 3 is a carried forward and add in a next No.

eg →

$$\begin{array}{r} 1 \ 2 \ 1 \ 1 \ 2 \\ 1] \ 3 \ 2 \ 6 \ 1 \cdot 3 \ 9 \\ \quad 1 \ 3 \ 2 \ 6 \ 1 \ 3 \cdot \\ \quad \quad 9 \cdot 5 \cdot 9 \cdot 5 \cdot 2 \ 6 \\ \quad \quad \quad 9 \cdot 3 \ 7 \cdot 3 \ 4 \cdot 2 \cdot \\ \hline 2355620 \end{array}$$

$$\begin{array}{r} 1 \ 1 \ 2 \ 1 \\ 2] \ 6 \ 3 \ 1 \cdot 2 \ 3 \\ \quad 9 \cdot 1 \ 8 \cdot 9 \cdot 1 \\ \quad \quad 8 \cdot 9 \cdot 2 \ 3 \ 7 \cdot \\ \quad \quad \quad 1 \ 3 \ 2 \ 9 \cdot 1 \\ \hline 257542 \end{array}$$

* Addition with Balancing Method.

$$\begin{array}{r} 392 \\ 895 \\ 716 \\ 560 \\ \hline 231513 \end{array}$$

1] First do the addition to all unit digit No.

$$2 + 5 + 6 + 0 = 13$$

Then add next digit No

$$4 + 4 + 1 + 6 = 15$$

$$3 + 8 + 7 + 5 = 23$$

$$\begin{array}{r} 131513 \\ \hline 231513 \\ \hline 2463 \end{array}$$

2] Take last digit No as it is and next no is carried forward and add in a next No.

$$\begin{array}{r} 231513 \\ \hline 231513 \\ \hline 2463 \end{array}$$

For e.g.

①

$$\begin{array}{r} 9326 \\ 1389 \\ 5876 \\ 8213 \\ \hline 23161824 \end{array}$$

$$\begin{array}{r} 23161824 \\ \hline 24804 \end{array}$$

②

$$\begin{array}{r} 727 \\ 574 \\ 771 \\ 262 \\ \hline 212214 \end{array}$$

$$\begin{array}{r} 212214 \\ \hline 2334 \end{array}$$

③

$$\begin{array}{r} 582 \\ 591 \\ 397 \\ 644 \\ \hline 193014 \end{array}$$

$$\begin{array}{r} 193014 \\ \hline 2214 \end{array}$$

★ Compliment No.

Rule - [Subtract all from 9, last from 10]

e.g. →

$$\textcircled{1} \begin{array}{r} 612 \\ \rightarrow 388 \\ \hline \end{array}$$

$$\textcircled{2} \begin{array}{r} 179 \\ 821 \\ \hline \end{array}$$

$$\textcircled{3} \begin{array}{r} 452 \\ 548 \\ \hline \end{array}$$

$$\textcircled{4} \begin{array}{r} 662 \\ 338 \\ \hline \end{array}$$

★ Subtraction

→ Vinculum No - [Indication of Negative No]
Vinculum No. is the combination of positive No and negative No.

The Vinculum is a horizontal line written over a digit which thereby make it negative. So 19 could be written as twenty minus one i.e. 2 [-1] where we write instead of with a bar over it. For e.g. $2\bar{1}$

★. How to find out the Vinculum No.

$$5\bar{2}8$$

- all negative No subtract from 9 and last from 10

$$5\bar{2}8 = 10 - 8 = 2, 9 - 2 = 7$$

- If next is positive No then -1 from that No

$$5 - 1 = 4$$

$$\begin{aligned} \text{Final answer} &= 5\bar{2}8 \\ &= \underline{\underline{472}} \end{aligned}$$

① eg → $\overline{1926} = \underline{\underline{0086}} =$ write 6 as it is.
 $\overline{92}$ subtract last No from 10 and next No from 9.
 $\overline{92} = \underline{\underline{802}}$

→ $\div 1$ from Positive No
 $1-1 = 0$

② $\overline{55812}$
 Ans - $\underline{\underline{44788}}$

③ $\overline{121210}$
 $\underline{\underline{120790}}$

* Subtraction with Vinculum Method

① $\begin{array}{r} 750236 \\ - 391658 \\ \hline 4\overline{4}1\overline{4}2\overline{2} \\ 358578 \end{array}$

i) do subtraction as it is and subtract all digit from 9 and last from 10 to removing the bar

② $\begin{array}{r} 95657 \\ - 61856 \\ \hline 34\overline{2}01 \\ 33801 \end{array}$

* there is no bar on 01 so that write down as it $\overline{15} = \underline{\underline{01}}$

* For removing the bar $\overline{2} = 10 - 2 = 8$

* 34 is a positive No. so that -1 from 34 = $34 - 1 = 33$

③ $\begin{array}{r} 652276 \\ - 391658 \\ \hline 3\overline{4}1\overline{4}2\overline{2} \\ \underline{\underline{260618}} \rightarrow \text{Ans} \end{array}$

★ Base Method Substraction.

①
$$\begin{array}{r} \boxed{101} \\ - \boxed{-69} \\ \hline 131 \\ 032 \\ \hline \end{array} \quad \begin{array}{l} \text{i) Find out the base - } 69^{\text{th}} \text{ base - } 100 \\ \text{2) Substrad the No [All from 9 A dast} \\ \text{From -10] } \end{array}$$

$$\begin{array}{r} 9 \ 10 \\ 69 \\ \hline 31 \end{array}$$

3) less the base and add the Compliment

②
$$\begin{array}{r} \begin{array}{c|c} 9 & 10 \\ \hline 5 & 28 \end{array} \\ - \begin{array}{c|c} 4 & 92 \end{array} \\ \hline \begin{array}{c|c} 5 & 08 \end{array} \end{array} \quad \begin{array}{l} 492 \text{ base is } 500 \end{array}$$

$$\underline{\underline{036}}$$

③
$$\begin{array}{r} \begin{array}{c|c} 9 & 9 & 10 \\ \hline 74 & 111 \end{array} \\ - \begin{array}{c|c} 5 & 214 \end{array} \\ \hline \begin{array}{c|c} 6 & 786 \end{array} \end{array} \quad \begin{array}{l} \underline{\underline{5214}} \text{ base is } \underline{\underline{6000}} \\ 74 - 6 = \underline{\underline{68}} \end{array}$$

$$\underline{\underline{68897}}$$

④
$$\begin{array}{r} \begin{array}{c|c} 9 & 9 & 9 & 10 \\ \hline 1 & 2547 \end{array} \\ - \begin{array}{c|c} 95 & 89 \end{array} \\ \hline \begin{array}{c|c} 1 & 0411 \end{array} \end{array} \quad \begin{array}{l} 9589 \text{ base is } 10000 \end{array}$$

$$\underline{\underline{02958}}$$

★ Rapid Subtraction

$$\begin{array}{r} 345 \\ - 199 \\ \hline 801 \\ \hline 1146 \\ - 1 \\ \hline \underline{\underline{146}} \end{array}$$

1) First find out the Compliment No.

$$\begin{array}{r} 199 \\ - 9910 \\ \hline 199 \\ \hline 801 \end{array}$$

[Subtract all from 9 last from 10]

2) Add 1st No and Compliment No

3) Subtract 1 from 1st digit No.

$$\begin{array}{r} 1146 \\ - 1 \\ \hline \underline{\underline{146 \text{ Ans}}} \end{array}$$

$$\begin{array}{r} 5216 \\ - 1398 \\ - 1217 \\ \hline \hline \end{array}$$

1) Find out the Compliment No.

$$\begin{array}{r} 1398 \\ - 8602 \\ \hline 1217 \\ - 8783 \\ \hline \end{array}$$

2) add both No in 1st No.

$$\begin{array}{r} 5216 \\ + 8602 \\ + 8783 \\ \hline 1111 \\ \hline 22601 \\ - 2 \end{array}$$

3) Subtract 2 from 1st digit No

$$\underline{\underline{02601 \text{ Ans.}}}$$

★ Multiplication

1] by 25, 250, 2500 - - - -

$$2145 \times 25 = \frac{214500}{4} = \underline{\underline{53625}}$$

★ 25 is a $\frac{1}{4}$ of 100 so divided by 4 and multiply100

$$2) 9326 \times 250 = \frac{9326000}{4} = \underline{\underline{2331500}}$$

$$3) 9872 \times 2500 = \frac{98720000}{4} = \underline{\underline{24680000}}$$

★ by 50, 500, 5000 - - - -

$$① 542 \times 50 = \frac{54200}{2} = \underline{\underline{27100}}$$

50 is a $\frac{1}{2}$ of 100 so divided by 2 and multiply 100

$$② 126 \times 500 = \frac{126000}{2} = \underline{\underline{63000}}$$

$$③ 89 \times 5000 = \frac{890000}{2} = \underline{\underline{445000}}$$

* By 125, 1250, 12500

$$\textcircled{1} \quad 986 \times 125 = \frac{986000}{8}$$

125 is a $\frac{1}{8}$ of 1000 so divided by 8 and three 0 at the end of No

$$\textcircled{2} \quad 5921 \times 125 = \frac{5921000}{8} = 740125$$

$$\textcircled{3} \quad 98 \times 1250 = \frac{980000}{8} = 1,22,500.$$

* Multiplication by 1 series. 11, 111, 1111.

$$\textcircled{1} \quad \begin{array}{r} 254 \\ \times 11 \\ \hline 2794 \end{array} \quad \begin{array}{l} \text{Just Put 0 in both side} \\ {}^0 254 {}^0 \\ \text{then do addition of 2 digit No.} \end{array}$$

$$0+4=4$$

$$5+4=9$$

$$2+5=7$$

$$2+0=2$$

$$\textcircled{2} \quad \begin{array}{r} {}^0 {}^0 1926 {}^0 {}^0 \\ \times 111 \\ \hline 213786 \end{array} \quad \begin{array}{l} \text{Put 00 in both side} \\ {}^0 {}^0 1926 {}^0 {}^0 \\ \text{do addition of 3 digit No.} \\ {}^0 {}^0 0+0+6=6 \end{array}$$

$$\underline{\underline{213786}}$$

do addition of 3 digit No.

$${}^0 {}^0 0+0+6=6$$

* Multiplication by 21, 31, --- 91, 211, 311 --- 911

[if ~~last~~ ^{first} digit is a diff No and remaining No is a 1 series]

$$\begin{array}{r} 03212^0 \\ \times \quad 21 \\ \hline 67452 \end{array}$$

1] Put 0 on both side
 03212^0
 2] Multiply by 1st digit No and do add ~~the~~ 2 digit No (Right to left).

$$0 \times 2 = 0 + 2 = 2$$

$$2 \times 2 = 4 + 1 = 5$$

$$2 \times 1 = 2 + 2 = 4$$

$$2 \times 2 = 4 + 3 = 7$$

$$2 \times 3 = 6 + 0 = 6$$

$$\begin{array}{r} 00512200 \\ \times 311 \\ \hline 1592942 \end{array}$$

1] Put ~~00~~ if multiply by 3 digit No so ~~put 00~~ on put 00 on both side.

$$00512200$$

2) Multiply by 1st digit No and add ~~next~~ 3 digit No [Right to left].

$$0 \times 3 = 0 + 0 + 2 = 2$$

$$0 \times 3 = 0 + 2 + 2 = 4$$

$$2 \times 3 = 6 + 2 + 1 = 9$$

$$2 \times 3 = 6 + 1 + 5 = 12$$

$$1 \times 3 = 3 + 5 + 0 + 1 = 9$$

$$5 \times 3 = 15 + 0 + 0 = 15$$

★ Multiplication by 12 to 19, 112, 113, — — 119.

[if last digit is a diff No and remaining No is 1 series]

①

$$\begin{array}{r}
 0 \quad \quad 0 \\
 1203 \\
 \times \quad 12 \\
 \hline
 \end{array}$$

★ Put 0 on the both side [if multiply No is 2 digit].

$$\begin{array}{r}
 0 \quad \quad 0 \\
 1203 \\
 \hline
 \end{array}$$

★ Multiply by last digit No and add 2 digit No [left to Right]

②

$$\begin{array}{r}
 00 \quad 1 \quad 1 \quad 1 \quad 00 \\
 3216 \\
 \times \quad 112 \\
 \hline
 \hline
 360192
 \end{array}$$

★ Put two 0 on the both side [if multiply No is 3 digit]

$$\begin{array}{r}
 00 \quad 3216 \quad 00 \\
 \hline
 \hline
 \end{array}$$

★ Multiply by last digit No and 3 digit No [left to Right]

$$2 \times 6 = 12 + 0 + 0 = 12$$

$$2 \times 1 = 2 + 6 + 0 + 1 = 9$$

$$2 \times 2 = 4 + 1 + 6 = 11$$

$$2 \times 3 = 6 + 2 + 1 + 9 + 1 = 10$$

$$2 \times 0 = 0 + 3 + 2 + 1 = 6$$

$$2 \times 0 = 0 + 0 + 3 = 3$$

Above Base

$$\begin{array}{r|l} 1 & 25 \\ \times 1 & 04 \\ \hline 129 & 100 \\ + & \\ \hline \underline{\underline{13000}} \end{array}$$

Base - 100
 $25 \times 04 = 100$
 $125 + 04 = 129$
 $129 \times 1 = 129$

②

$$\begin{array}{r|l} 8 & 26 \\ \times 8 & 30 \\ \hline 6848 & 780 \\ + & \\ \hline \underline{\underline{685580}} \end{array}$$

Base - 800
 $26 \times 30 = 780$
 $826 + 30 = 856$
 $856 \times 8 = 6848$

③

$$\begin{array}{r|l} 2004 & \\ \times 2 & 130 \\ \hline 4268 & 520 \\ + & \\ \hline \underline{\underline{4268520}} \end{array}$$

Base - 2000
 $004 \times 130 = 520$
 $2004 + 130 = 2134$
 $2134 \times 2 = \underline{\underline{4268}}$

★ Combined based [Above base X below based]

① $465 - 35$ Base = 500
 $\times 530 + 30$ $-35 \times 30 = -1050$
 $\hline 246450 - 1050$ $= 465 + 30 = 495$
 \hline $- 495 \times 500 = 247500$
 $- 247500 - 1050$
 $= 246450$

② $873 + 73$ Base = 800
 $\times 692 - 108$ $73 \times -108 = -7884$
 $\hline 604116$ $873 - 108 = 765$
 $765 \times 800 = 612000$
 $612000 - 7884 = 604116$

★ Multiplication by 9 series 9, 99, 999, 9999

[Equal No]

① 99999
 $\times 48532$
 $\hline 485315168$

① $48532 - 1 = 48531$
 ② 48531 Subtract all No from 9
 99999 9
 48531
 $\hline 51668$

② 999
 $\times 342$
 $\hline 341658$

① $342 - 1 = 341$
 ② 341 Subtract all No from 9
 999
 341
 $\hline 658$

[More Digit of 9 series]

Step

$$\begin{array}{r} \textcircled{1} \quad 99999 \\ \times \quad 145 \\ \hline 14499855 \end{array}$$

$$\textcircled{1} \quad 145 - 1 = 144$$

$\textcircled{2}$ 99999 (5 digit) is more than 145 (3 digit No.). it means it is more than 2 digit No. So you write 99 in the middle No.

$\textcircled{3}$ Subtract 144 from all No from 9.

$$\begin{array}{r} 999 \\ - 144 \\ \hline 855 \end{array}$$

$$\begin{array}{r} \textcircled{2} \quad 99999 \\ \times \quad 1747 \\ \hline 174698253 \end{array}$$

$$\textcircled{1} \quad 1747 - 1 = 1746$$

$\textcircled{2}$ write 9 in middle place

$$9999 - 1746 = 8253$$

$$\begin{array}{r} \textcircled{3} \quad 99999 \\ \times \quad 3723 \\ \hline 372296277 \end{array}$$

[Less digit of 9 series]

$$\begin{array}{r} \textcircled{1} \quad 99 \\ \times \quad \overline{632} \\ \hline 62568 \end{array}$$

* 99 is a 2 digit No So that
 @ Give the bar in next 2 digit No. $\overline{632}$

* Remaining No - 6 is there
 + add 1 in Remaining No

$$6 + 1 = 7$$

$$\text{So } \overline{632} - 7 = \underline{\underline{625}}$$

$\overline{32}$ is a Vinculum No for
 to remove the bar $\overline{32}$
 68

$$\begin{array}{r} \textcircled{2} \quad 999 \\ \times \quad \overline{74518} \end{array}$$

$$74 + 1 = 75$$

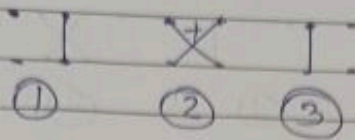
$$74518 - 75 = 74443$$

$$74443482.$$

$\overline{518}$ is a vinculum No to
 remove the bar $\overline{518} = 482$

Multiplication [2 x 2 digit]

$$\begin{array}{r}
 \textcircled{1} \quad 56 \\
 \times 24 \\
 \hline
 1032 \\
 224 \\
 \hline
 1344
 \end{array}$$



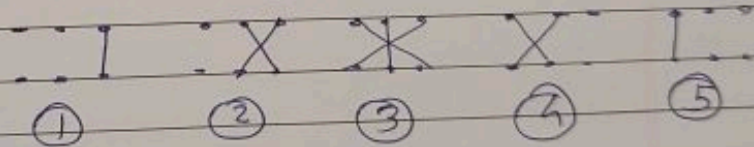
$$\begin{array}{r}
 \textcircled{2} \quad 39 \\
 \times 15 \\
 \hline
 0324 \\
 +2145 \\
 \hline
 585
 \end{array}$$

$$\begin{array}{r}
 \textcircled{3} \quad 89 \\
 \times 12 \\
 \hline
 825 \\
 +18 \\
 \hline
 1068
 \end{array}$$

$$\begin{array}{r}
 \textcircled{4} \quad 15 \\
 \times 30 \\
 \hline
 315 \\
 +0 \\
 \hline
 455
 \end{array}$$

* Multiplication [3 x 3 digit]

$$\begin{array}{r}
 .1 \ 2 \ 3 \\
 \times 5 \ 2 \ 5 \\
 \hline
 \end{array}$$



$$\begin{array}{r}
 5 \ 12 \ 24 \ 16 \ 15 \\
 \hline
 64575
 \end{array}$$

$$\begin{array}{r}
 \textcircled{2} \quad 569 \\
 \times 328 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 \textcircled{3} \quad 319 \\
 \times 538 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 \textcircled{4} \quad 813 \\
 \times 756 \\
 \hline
 \end{array}$$

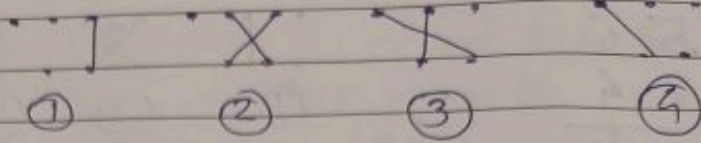
$$\begin{array}{r}
 15 \ 28 \ 79 \ 66 \ 72 \\
 \hline
 186632
 \end{array}$$

$$\begin{array}{r}
 15 \ 14 \ 72 \ 35 \ 72 \\
 \hline
 171622
 \end{array}$$

$$\begin{array}{r}
 56 \ 47 \ 74 \ 21 \ 18 \\
 \hline
 614628
 \end{array}$$

Multiplication [3x 2 digit]

$$\begin{array}{r} \textcircled{1} \quad 561 \\ \times \quad 32 \\ \hline 1528 \quad | \quad 1502 \\ 2 \quad | \quad 17952 \\ \hline \end{array}$$



$$\begin{array}{r} \textcircled{2} \quad 913 \\ \times \quad 23 \\ \hline 1829 \quad | \quad 0909 \\ 2 \quad | \quad 20999 \\ \hline \end{array}$$

$$\begin{array}{r} \textcircled{3} \quad 824 \\ \times \quad 24 \\ \hline 1648 \quad | \quad 0816 \\ 3 \quad | \quad 19696 \\ \hline \end{array}$$

$$\begin{array}{r} \textcircled{4} \quad 915 \\ \times \quad 25 \\ \hline 1830 \quad | \quad 1525 \\ 5 \quad | \quad 22875 \\ \hline \end{array}$$

Division

* Division by 25, 250, 2500 -

① $3621/25 = 144.84$ ① 25 is a $\frac{1}{4}$ of 100 So

$$\underline{\underline{144.84}}$$

multiply 4.

$$3621 \times 4 = 14484$$

② Give decimal point after 2 digit No (Right to left.)

$$144.84$$

* Div by 50, 500, 5000 -

$3621/50 = 72.42$ ① 50 is $\frac{1}{2}$ of 100 so multiply 2

$$\underline{\underline{72.42}}$$

$$3621 \times 2 = 7242$$

② Give decimal point after 2 digit No (Right to left.)

$$72.42$$

* Div by 125, 1250 -

① 125 is $\frac{1}{8}$ of 1000 So multiply 8

$$3621 \times 125$$

$$3621 \times 8 = 28968$$

$$\underline{\underline{16.968}}$$

② Give decimal point after 3 digit (Right to left.)

$$16.968$$

★ Div by 11

① $98839 / 11$

$$\begin{array}{r|rrrrr}
 11 & 9 & 8 & 8 & 3 & 9 \\
 -1 & & -9 & 1 & -9 & 6 \\
 \hline
 & 9 & -1 & 9 & 6 & 15 \\
 & & 8 & 9 & 8 & 4 \\
 & & & & +1 & 04 \\
 \hline
 & 8 & 9 & 8 & 5 & \\
 \hline
 \end{array}$$

Q = 8985

R = 04

① 10 is 11th base So that.

~~10~~ - 11 = ~~1~~ - 1

② So multiply all the No. with -1

③ 1st digit No take 1st digit No as it is = 9

~~9~~ × -1 = -9

8 + (-9) = -1

-1 × -1 = 1

8 + 1 = 9

9 × -1 = -9

3 + (-9) = -6

-6 × -1 = 6

④ last digit No is your Remainder

15 ÷ 11 = Q = 1 R = 4

⑤ (add in next No)

⑥ 98839 Convert into Positive

No = 8984

~~⑦ 15~~

② $98736 / 11$

$$\begin{array}{r|rrrrr}
 11 & 9 & 8 & 7 & 3 & 6 \\
 -1 & & -9 & 1 & -8 & 5 \\
 \hline
 & 9 & -1 & 8 & 5 & 11 \\
 & & 8 & 9 & 7 & 6 \\
 \hline
 & 8 & 9 & 7 & 6 & \\
 \hline
 \end{array}$$

Q 8976 R

★ Division by any 2 digit No.

① $6342 / 33$.

$$\begin{array}{r}
 292-Q \\
 33 \overline{) 6342} \\
 \underline{-33} \\
 304 \\
 \underline{-297} \\
 0072 \\
 \underline{66} \\
 6-R
 \end{array}$$

① divide 1st digit No to 1st digit No.

~~3~~ $3 \times 2 = 6$ & 0

$33 \times 2 = 66$

$33 \times 9 = 297$

$33 \times 2 = 66$

② $98736 / 44$

$$\begin{array}{r}
 \cancel{9873} \cdot \\
 2244 \\
 44 \overline{) 98736} \\
 \underline{-88} \\
 107 \\
 \underline{-88} \\
 193 \\
 \underline{176} \\
 176 \\
 \underline{176} \\
 000
 \end{array}$$

$4 \times 2 = 8$.

$44 \times 2 = 88$

$4 \times 4 = 16$

$44 \times 4 = 176$

Q = 2244

R = 0.