Operations on Large numbers

Addition, Subtraction, Multiplication and Division

Grade 5

Additions

$$
\begin{array}{r}
5\,6\,4\,7\,8\,1\,2 \\
+\;2\,7\,8\,5\,7\,4\,5 \\
\hline
8,4\,3\,3,5\,5\,7 \\
\hline
\end{array}
$$

8

Subtraction

$$
\begin{array}{r}
7\,8\,5\,6\,4\,2\,9 \\
-\;3\,6\,9\,8\,3\,6\,7 \\
\hline
4\,1\,6\,8\,0\,6\,2 \\
\hline
\end{array}
$$

Find the difference between 26,879,354 and 63,457,148

" subtract smaller no. from the bigger number. "

$$\begin{array}{r} 63\,457\,148 \\ -\ 26\,879\,354 \\ \hline 36,577,794 \end{array}$$

Subtract 2736879 from 5342568

$$\begin{array}{r} 5342568 \\ -\ 2736879 \\ \hline 2605689 \end{array}$$

Q. A company earned ₹ 14,632,739 in year 2023. Next year the earning of the company increased by ₹ 3974687. How much did the company earn in the year 2024?

Sol.

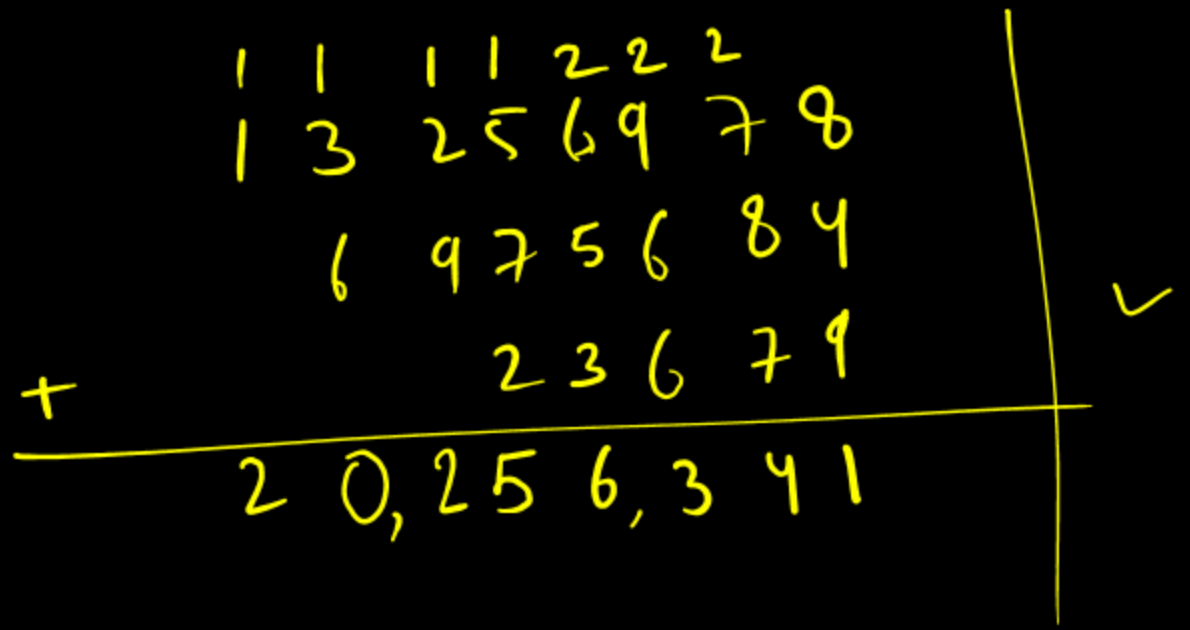
Earning in 2024 = ₹ (14,632,739 + 3,974,687)

$$\begin{array}{r} 14632739 \\ +\ 03974687 \\ \hline 18607426 \end{array}$$

⇒ The company earned ₹ 18,607,426.

Find the sum of

① 13256978 + 1975684 + 23679



$$474,361,279 + 236,554,385 + 53,168,837$$

$$\begin{array}{r} {\scriptstyle 1\ \ 1\ \ \ 1\ \ 1\ \ 1\ \ 2\ \ 2} \\ 474361279 \\ 236554385 \\ + \quad 53168837 \\ \hline 763,084,501 \\ \hline \end{array}$$

Q. The sum of two numbers is 3148654. If one of the numbers is 1952789, find the other number.

Sol: The sum of two numbers = 3148654

one number = 1952789

The other number = 3148654 − 1952789

$$\begin{array}{r} 3148654 \\ -\ 1952789 \\ \hline 1,1\,95,865 \end{array}$$

Hence, the number is 1195865.

Add: 36794528 , 28945 , and 994201

37,817,674

Find the difference between 6010036 and 5419947

6,010,036
5,419,947

5,90,089

Q. What must be subtracted from 90,05,413 to get 79,06,547?

Hint: $(9005413 - 7906547) = 10,98,866$

Q. What must be added to 5678469 to make 6164324?

Hint: $[6164324 - 5678469]$

10 lakh = 1 million

Q. The total population of a city is 15207635. There are 6751574 men and 6036425 women and the remaining are children. How many children are there in the city?

Soln.

$$\text{No. of children} = \text{Total population} - (\text{No. of men} + \text{No. of women})$$

$$= 15207635 - (6751574 + 6036425)$$

$$= 15207635 - 12787999$$

$$= 2419636$$

$$537 + 239 = 776$$

$$500 + 30 + 7 + 200 + 30 + 9$$

$$700 + 60 + 16$$

$$776$$

$$4227 + 5089$$

$$9000 + 200 + 100 + 16$$

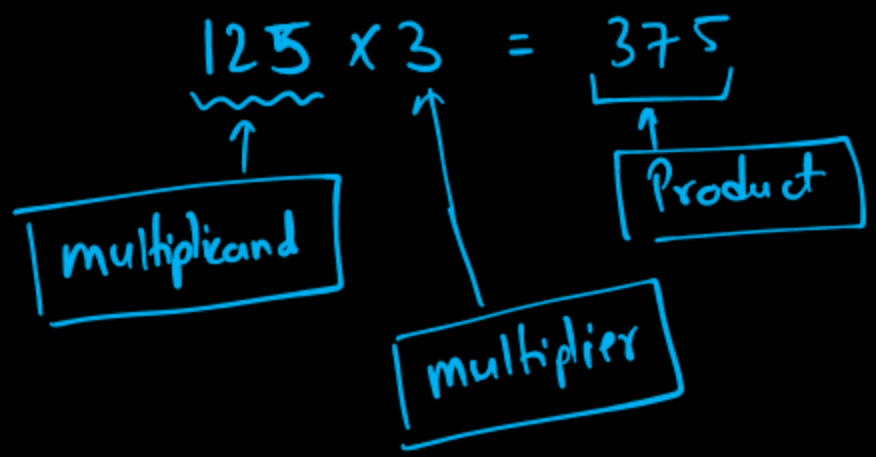
$$9316$$

$5972 + 6869$

$\Rightarrow 11000 + 1700 + 130 + 11$

12831

Multiplication



$$\begin{array}{r} 12 \\ \times\ 5 \\ \hline 60 \end{array}$$

Properties of multiplication

① Order property of multiplication

The product of two or more numbers does not change, when the order of the numbers is changed.

eg: $125 \times 3 = 3 \times 125$

$4 \times 5 \times 2 = 2 \times 4 \times 5$

(11) Grouping property of multiplication.

⇒ The product of three or more numbers does not change when the grouping of the numbers is changed.

Eg:

$$(2 \times 4) \times 5 = 2 \times (4 \times 5)$$

$$(123 \times 27) \times 52 = 123 \times (27 \times 52)$$

(iii) Distributive property of multiplication over addition / subtraction.

$2 \times (100 + 25) = (2 \times 100) + (2 \times 25)$

eg:

$4 \times 122 = 4 \times (100 + 22)$

$= 4 \times 100 + 4 \times 22$

$= 488$

$8 \times 54 = 8 \times (50 + 4)$

$= 400 + 32$

$= 432$

$$\frac{2}{3} \otimes 2\frac{3}{7} \otimes \frac{9}{5}$$

$$\Rightarrow \frac{2}{3} \div \frac{3}{7} \Rightarrow \frac{2}{3} \times \frac{7}{3}$$

$$\Rightarrow \frac{2}{3} \div \frac{3}{7} \div \frac{9}{5}$$

$$\Rightarrow \frac{2}{3} \times \frac{7}{3} \times \frac{5}{9}$$

eg # $10 \times (15 - 4) = 10 \times 15 - 10 \times 4$

$= 150 - 40$

$= 110$

* $4 \times 21 = 4 \times (20 + 1) = 80 + 4 = 84$

$12 \times 32 = 12 \times (30 + 2) = 12 \times 30 + 12 \times 2$

$= 360 + 24$

$= 384$

$12 \times 39 = 12 \times (30 + 9) = 360 + 108 = 468$

$= 12 \times (40 - 1) = 12 \times 40 - 12 \times 1$

$= 480 - 12 = 468$

=

(iv) Multiplicative property of 1.

(Any number) × 1 = the number itself.

eg. 462 × 1 = 462

362 = 362 × 1

(v) Multiplicative property of zero (0).

(Any number) × 0 = 0

419 × 0 = 0

Multiplication by 10, 100, 1000, 10 000, etc.

Eg: $12 \times 10 = 120$

$360 \times 10 = 3600$

$84 \times 100 = 8400$

$3490 \times 100 = 349000$

$87 \times 1000 = 87000$

Multiplication by multiples of 10s, 100s, 1000s, etc.

$$\begin{cases} 10 \to 20, 30, 40, 50, \cdots \\ 100 \to 100, 200, 300, 400, \cdots \\ 1000 \to 1000, 2000, 3000, 4000, \cdots \end{cases}$$

$$\begin{array}{r} {\scriptstyle 1\ \ 1} \\ 589 \\ \times\ \ 2 \\ \hline 1178 \end{array}$$

Example: (i) Find the product of 589×20

$$589 \times 20 = 589 \times 2 \times 10$$

$$= 1179 \times 10$$

$$= 11780$$

(ii) 1356×90

$$= 1356 \times 9 \times 10 = 12204 0$$

(iii) 294×300

$294 \times 3 \times 100$

88200

(iv) 4567×500

$= 4567 \times 5 \times 100$

$= 2,285,500$

(v) 378×4000

$= 378 \times 4 \times 1000$

$= 1,512,000$

Q. $2 \times 467 \times 5 = (2 \times 5) \times 467$

$= 10 \times 467$

$= 4670$

$5 \times 4 = 20$

5×2	$= 10$
25×4	$= 100$
125×8	$= 1000$

Q. $4 \times 237 \times 25 = 237 \times 100 = 23700$

Q. $5 \times 1986 \times 20 = 1986 \times 100$

$= 198600$

Q. $2 \times 5726 \times 500 = 5,726,000$

Multiplication of large number

eg: 5347×486

$5347 \times (400 + 80 + 6)$

$5347 \times 400 + 5347 \times 80 + 5347 \times 6$

$$\begin{array}{r} 5347 \\ \times \quad 486 \\ \hline 32082 \\ 427760 \\ 2138800 \\ \hline 2598642 \end{array}$$

short method

(e)

H.W.

① Multiply 9896 by 2347 = 23225112

② 23689 x 137 = ~~9549176~~ | 32,45,393

③ 3265 x 2784 = 9089760 | 9089760

c

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  23689
X   137
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    3
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Q. The cost of a scooter is ₹ 36453. Find the cost of 270 scooters.

Sol:

Cost of 1 scooter = ₹ 36453.

Cost of 270 scooters = ₹ (36453 × 270) = ₹ (36453 × 27 × 10)

$$\begin{array}{r} 36453 \\ \times \quad 27 \\ \hline 984231 \quad \times 10 \end{array}$$

Cost of 270 scooters will be ₹ 9842310

Q. The cost of a bike is ₹ 2895. Find the cost of 1486 bikes.

Sol:

Cost of 1 bike = ₹ 2895

Cost of 1486 bikes = ₹ (2895 × 1486)

$$
\begin{array}{r}
2895 \\
\times\ 1486 \\
\hline
4301\boxed{5}70 \\
\hline
9
\end{array}
$$

$$
\begin{array}{r}
\overset{3}{2}\overset{3}{8}\overset{2}{9}5 \\
1486 \\
\hline
17370 \\
231600 \\
\tilde{1}158000 \\
2895000 \\
\hline
4301970 \\
\hline
\end{array}
$$

Q. A newspaper contains 124 columns. Each column contain 136 lines. Each line has 36 letters. How many letters are there in the newspaper

Sol: Total No. of lines in the newspaper = 124 × 136

$$\begin{array}{r} 124 \\ \times\ 136 \\ \hline \end{array}$$

= 16864

Total No. of letters = 16864 × 36

$$\begin{array}{r} 16864 \\ \times\ 36 \\ \hline \end{array}$$

= 6,07,104 =

Multiply

2356 x 126 x 103

2356 x 12978

= 41585168

Continued Product

2 x 12 = 24

6 x 4

24

3249×40

$(3249 \times 4) \times 10$

129960

Division

Divide 2950682 by 35 → Divisor

↑ Dividend

$\frac{15}{2}$ $\frac{150}{7}$

35) 2950682 (

8 4 3 0 5 → Q

2950682 → 7 → Rem

35

1929
- 175

35 × 4 = 140

35 × 5 = 175

35 × 10 = 350

35 × 9 = 315 − 35

35 × 8 = 280

Q: Divide 2017908 by 569

3546 → R

569) 2017908 (

- 1707

3109

- 2845

2640

- 2276

3648

- 3414

234 ← 1

22
569
x 3
1707 → 4

3
569
x 5
2845

23
569
x 4
2276

45
569
x 6
3414

Divide 403354 by 329, find Quotient and Remainder.

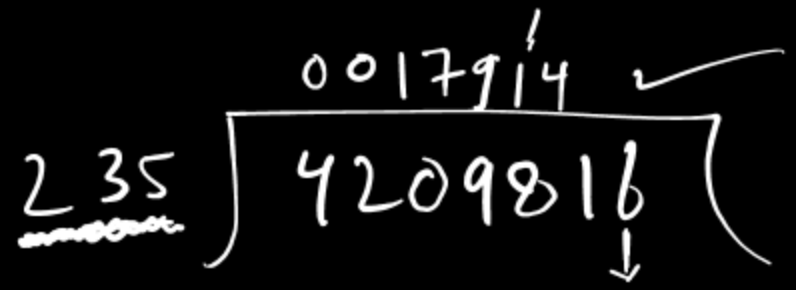
$$
\begin{array}{r}
1226 \longrightarrow Q. \\
329 \overline{)\,403354} \\
-329\downarrow \\
\hline
743 \\
-658\downarrow \\
\hline
855 \\
-658 \\
\hline
1974 \\
-1974 \\
\hline
0 \longrightarrow R
\end{array}
$$

$403 > 329$

329×2

329×6

Divide 4209816 by 235



26 — R

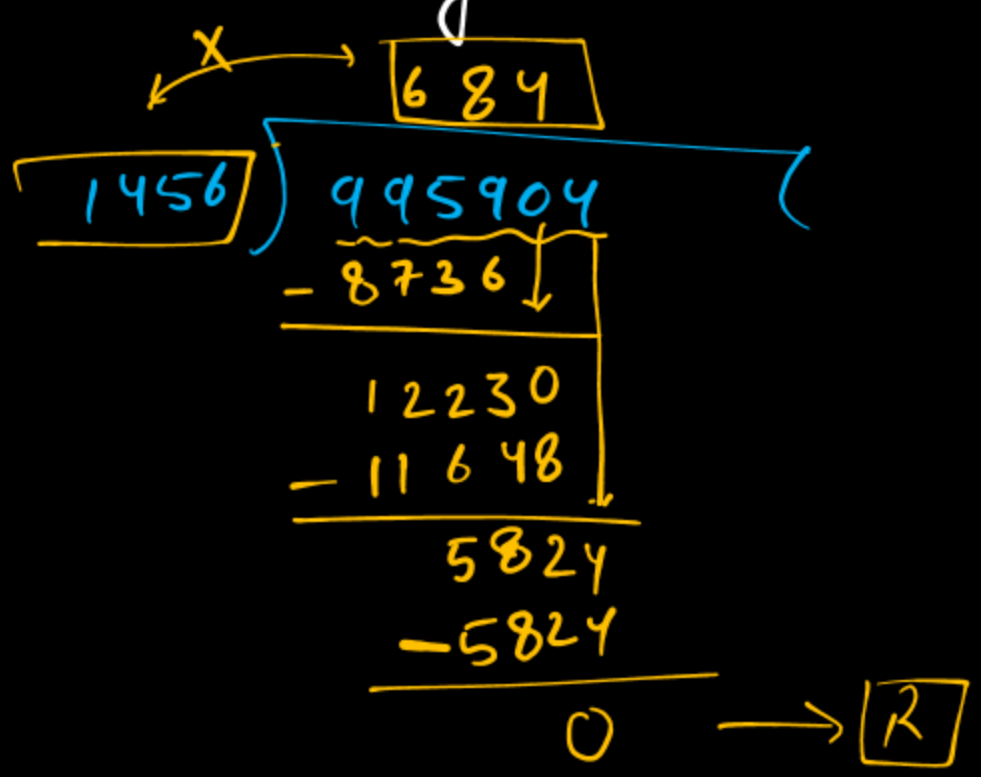
Divide:

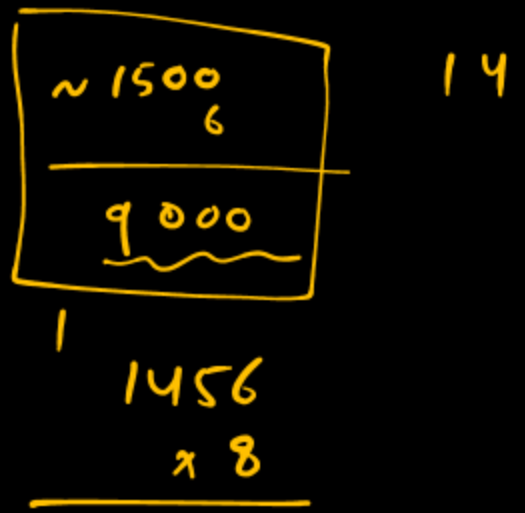
(i) 4093274 by 63

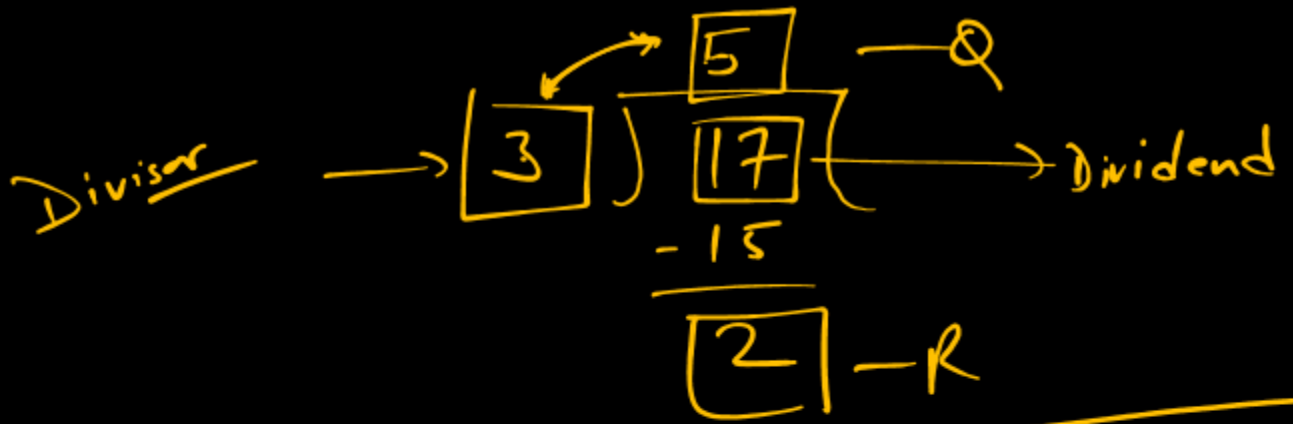
(ii) 52829003 by 615

(iii) 9200102 by 825

* Divide 995904 by 1456







Dividend = Divisor × Quotient + Remainder

$= (3 \times 5) + ₹2$

$= 17$

= Dividend.

"Product of two numbers" Problem

$$2 \times 4 = 8$$

Q. Product of two numbers is 8, if one of the number is 2, find the other number.

$$2 \overline{)8} \quad 4$$

$$-8$$

$$0$$

other number is : 4

Q. The product of two numbers is 1785483. If one of the numbers is 987, find the other number.

Sol:

Given product = 1785483

given number = 987

other number = $1785483 \div 987$

$$
\begin{array}{r}
1809 \\
987\overline{)1785483} \\
\end{array}
$$

$\therefore$ othe numbe is 1809

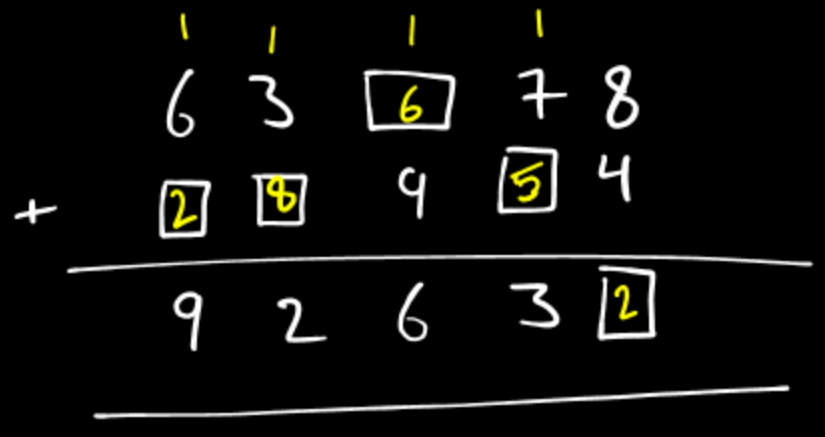
Q. The cost of 347 Radios is ₹ 1664212. What is the cost of one radio?

Sol. → Cost of 347 Radios = ₹ 1664212

→ Cost of 1 Radio = ₹ (1664212 ÷ 347)

$$347\overline{)1664212}\,(4796$$

∴ Cost of 1 radio is ₹ 4796



Find missing digits

Q. The difference of two numbers is 8,67,089. If the smaller number is 25,76,997, find the larger one.

Larger number = 8,67,089 + 25,76,997

34,44,086

End of the chapter.