

3. Multiplication and Division

$$1,234 \times 2,924 = ? \quad 3,648 \div 12 = ?$$



Key Concepts

1. Multiplication of large numbers
2. Multiplication by 10, 100 and 1,000
3. Division of large numbers
4. Division by 10, 100 and 1,000



Why should I read this chapter?

We need **multiplication** and **division** for solving many real-life problems, starting from paying bills in a shop to distributing sweets among our friends and other purposes.



Recap

1. Find the products.

a. $265 \times 24 =$

b. $1,000 \times 5 =$

c. $524 \times 88 =$

d. $958 \times 33 =$

2. Divide the following numbers and find the quotient (Q) and the remainder (R).

a. $3,025 \div 5$ Q = ; R =

b. $3,269 \div 17$ Q = ; R =

c. $750 \div 25$ Q = ; R =

d. $535 \div 13$ Q = ; R =



Prep-up

In a library, there are books on 12 different subjects. Also, on each subject, there are 2,104 books.

Which operation do we have to do to find the total number of books in the

library?



There are 48 shelves in the library, each shelf having an equal number of books. We want to find out the number of books on each shelf.

What operation do we have to do now?



Multiplication of large numbers

$$\begin{array}{r} 125 \\ \times 25 \\ \hline 3125 \end{array}$$

125 → **multiplicand**

× 25 → **multiplier**

3125 → **product**

The number to be multiplied is called the multiplicand.

The number with which we multiply is called the multiplier.

The result obtained after multiplying the given numbers is called the product.

Example 1: Multiply 24,678 with 32.

$$\begin{array}{r} 24678 \\ \times \quad 32 \\ \hline 49356 \end{array}$$

Step 1
Multiply the multiplicand with the digit in the ones place of the multiplier.

$$\begin{array}{r} 24678 \\ \times \quad 32 \\ \hline 49356 \\ 740340 \end{array}$$

Step 2
Put a 0 below the digit in the extreme right of the obtained product. Multiply the multiplicand with the digit in the tens place of the multiplier and write the product as shown.

$$\begin{array}{r} 24678 \\ \times \quad 32 \\ \hline 49356 \\ + 740340 \\ \hline 789696 \end{array}$$

Step 3
Add the products obtained in steps 1 and 2 to get the final product.

Therefore, $24,678 \times 32 = 7,89,696$.

Multiply 2,658 with 387.



2	6	5	8
×	3	8	7

Step 1

2	6	5	8
×	3	8	7

Step 2

2	6	5	8
×	3	8	7

Step 3

2	6	5	8
×	3	8	7
+			

Step 4

Therefore, $2,658 \times 387 =$



Progress Meter 1

1. Find the products.

a.

1	2	2	4
×	2	1	2

b.

5	6	7	9
×	1	3	5

c.

2	7	5
×	9	6

d.

4	5	6	
×	2	2	2

e.

3	6	1	4
×	2	6	

f.

2	7	5	
×	3	1	3

2. Arrange the numbers vertically and multiply them.

a. $7,044 \times 285$

b. $46,283 \times 26$

c. $12,437 \times 45$

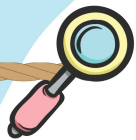
d. 739×144

e. $2,641 \times 375$

f. $4,245 \times 206$

g. $3,435 \times 142$

h. $3,556 \times 560$

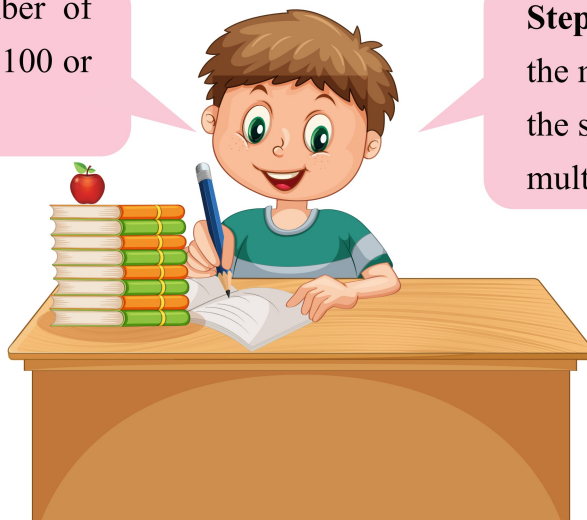


Multiplication with 10, 100 and 1,000

In order to multiply a given number with 10, 100 or 1,000, follow the steps given below.

Step 1: Count the number of 0(s) of the multiplier 10, 100 or 1,000.

Step 2: In the product, write the multiplicand followed by the same number of 0(s) as the multiplier 10, 100 or 1,000.



Example 3: Find the product of 5,612 and 10.

Solution: Number of 0(s) in the multiplier 10 is 1.

Hence, $5,612 \times 10 = 56,120$.

1. Find the product of 68,901 and 100.

Number of 0(s) in the multiplier 100 is .

Hence, $68,901 \times 100 =$.

2. Find the product of 5,500 and 1,000.

Number of 0(s) in the multiplier is .

Hence, $5,500 \times 1,000 =$.



Progress Meter 2

1. Find the product of the following.

- | | | | |
|-------------------------|---------------------------|--------------------------|---------------------------|
| (a.) $3,261 \times 100$ | (b.) $65,214 \times 100$ | (c.) $69,850 \times 10$ | (d.) $100 \times 1,000$ |
| (e.) $12,045 \times 10$ | (f.) $3,210 \times 1,000$ | (g.) $32,601 \times 100$ | (h.) $2,354 \times 1,000$ |

Word problems on multiplication

Example 4: A factory manufactures 21,048 bicycles in a month. How many bicycles does it manufacture in a year?



Solution:

number of months in a year = 12

number of bicycles manufactured in a month = 21,048

number of bicycles manufactured in 12 months = $21,048 \times 12 = 2,52,576$

$$\begin{array}{r} 21048 \\ \times 12 \\ \hline 42096 \\ + 210480 \\ \hline 252576 \end{array}$$

The factory manufactures 2,52,576 bicycles in a year.

Example 5: Raj typed 2,140 words on a page. How many words can he type on 215 pages?



Solution:

number of words on each page =

number of pages =

number of words on 215 pages = \times =

$$\begin{array}{r} 2140 \\ \times 215 \\ \hline \\ + \\ \hline \end{array}$$

Raj can type words on 215 pages.

Progress Meter 3

1. Solve the following number stories.

- a. If there are 112 beads in a necklace, find the total number of beads in 3,218 such necklaces.



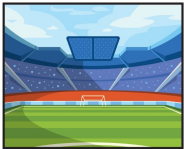
- b. A barrel contains 346 litres of oil. Find the quantity of oil in 1,112 such barrels.

- c. A factory produces 4,234 bulbs every day. How many bulbs will the factory be able to manufacture in a non-leap year?



- d. Sara earns ₹15,999 per month. How much will she earn in a year?

- e. If a man earns ₹18,023 every month, how much will he earn in two years?



- f. In a stadium, there are 1,108 seats in a row. If there are an equal number of seats in each row, then find the total number of seats in 205 rows.

- g. The cost of a travel bag is ₹2,300. What is the cost of 1,000 such travel bags?



- h. A carton contains 112 bottles of juice. How many bottles of juice will be there in 1,132 cartons?



Division of large numbers

A divisor is a number by which the dividend is to be divided.

divisor

$$\begin{array}{r}
 13 \\
 8 \overline{) 105} \\
 \underline{- 8} \\
 25 \\
 \underline{- 24} \\
 1
 \end{array}$$

quotient

The quotient is the number obtained when the dividend is divided by the divisor.

The number that is left after division is called the remainder.

remainder

dividend

A dividend is a number that is to be divided.

Example 6: Divide 33,115 by 27.

$$\begin{array}{r}
 1 \\
 27 \overline{) 33115} \\
 \underline{- 27} \downarrow \\
 61
 \end{array}$$

Step 1

Since 27 is 2-digit number, consider the first two digits (33) of the dividend.

$$27 \times 1 = 27; 27 \times 2 = 54$$

We know that $27 < 33$ and $54 > 33$. So, write 1 in the quotient.

Now, $33 - 27 = 6$. Hence, write 6 below 7.

$$\begin{array}{r}
 1226 \\
 27 \overline{) 33115} \\
 \underline{- 27} \downarrow \\
 61 \\
 \underline{- 54} \downarrow \\
 71 \\
 \underline{- 54} \downarrow \\
 175 \\
 \underline{- 162} \\
 13
 \end{array}$$

Step 2

Bring down next digits from the dividend as shown with arrows, one step at a time, and divide in the same manner as done in Step 1 until we get a remainder which is less than the divisor, 27.

Hence, quotient (Q) = 1,226 and remainder (R) = 13.

Example 7: Divide 1,418 by 125.

$$\begin{array}{r} 1 \\ 125 \overline{) 1418} \\ \underline{-125} \\ 16 \end{array}$$

Step 1

Since 125 is a 3-digit number, consider the first three digits (141) of the dividend. $125 \times 1 = 125$; $125 \times 2 = 250$

We know that $125 < 141$ and $250 > 141$.

So, write 1 in the quotient. Now, $141 - 125 = 16$. Write 16 in the bottom.

$$\begin{array}{r} 11 \\ 125 \overline{) 1418} \\ \underline{-125} \downarrow \\ 168 \\ \underline{-125} \\ 43 \end{array}$$

Step 2

Bring down 8 beside 16 and we get 168.

We know that $125 < 168$ and $250 > 168$.

Write 1 in the quotient.

$168 - 125 = 43$ (Stop the division process as the remainder is 43 which is less than 125.)

Hence, quotient (Q) = 11 and remainder (R) = 43.

Divide 33,976 by 274.

$$\begin{array}{r} 274 \overline{) 33976} \\ \underline{\hspace{1cm}} \\ \underline{\hspace{1cm}} \\ \underline{\hspace{1cm}} \end{array}$$



Hence, quotient (Q) = remainder (R) = .



Progress Meter 4

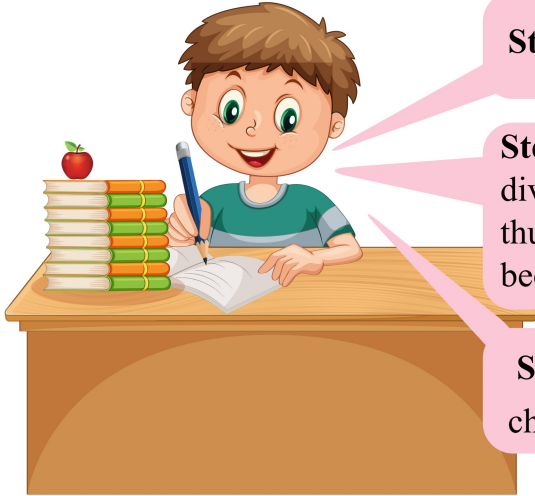
1. Find the quotient and the remainder in each of the following cases.

- a. $31,545 \div 81$ b. $71,102 \div 11$ c. $52,222 \div 323$ d. $74,887 \div 108$
e. $53,506 \div 42$ f. $67,175 \div 35$ g. $63,885 \div 851$ h. $82,001 \div 813$



Division by 10, 100 and 1,000

In order to divide a given number by 10, 100 and 1,000, follow the steps given below.



Step 1: Count the number of zeros at the end of the divisor.

Step 2: Select the same number of digits from the right of the dividend as the number of zeros in the divisor. The number thus obtained (without changing the order of the digits) becomes the remainder.

Step 3: The remaining digits of the dividend (without changing their order) will be the quotient.

Example 8: Divide 41,502 by 10.

Number of 0(s) in the divisor 10 is 1.

Hence, the quotient is 4,150 and the remainder is 2.

1. Divide 36,256 by 100.

Number of 0(s) in the divisor 100 is .

Hence, quotient = and remainder = .

2. Divide 2,05,000 by 1,000.

Number of 0(s) in the divisor is .

Hence, quotient = and remainder = .



Progress Meter 5

1. Divide the given numbers and find the quotient and remainder.

a. $23,100 \div 100$ b. $28,918 \div 100$ c. $43,280 \div 10$

d. $65,025 \div 10$ e. $57,000 \div 1,000$ f. $89,263 \div 10$

g. $16,142 \div 1,000$ h. $18,817 \div 100$ i. $31,070 \div 1,000$

Word problems on division

Type 1: Examples with 0 remainder

Example 9: Akash paid ₹49,280 to book flight tickets for 14 people.
Find the cost of each ticket.



Solution:

total cost of the tickets = ₹49,280

number of people = 14

cost per ticket = ₹49,280 ÷ 14

= ₹3,520

$$\begin{array}{r} 3520 \\ 14 \overline{) 49280} \\ \underline{-42} \\ 72 \\ \underline{-70} \\ 28 \\ \underline{-28} \\ 00 \\ \underline{-0} \\ 0 \end{array}$$

Q = 3,520 ; R = 0

Therefore, the cost of each ticket is ₹3,520.

Example 10: In an army camp, provisions worth ₹31,240 were allotted for 220 soldiers.
Find the cost of provisions allotted for each soldier.

Solution:

total cost of provisions = ₹

number of soldiers =

cost of provisions allotted for each soldier

= ₹ ÷

= ₹



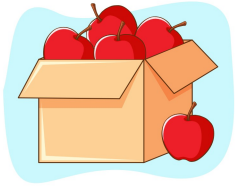
$$\begin{array}{r} 220 \overline{) 31240} \\ \underline{} \\ \underline{} \\ \underline{} \\ \underline{} \\ \end{array}$$

Q = ; R = 0

The cost of provision allotted for each soldier is ₹ .

Type 2: Example with non zero remainder

Example 11: If 77,127 apples need to be packed in 567 boxes, then how many apples should be packed in each box? How many apples will be left unpacked?



Solution:

total number of apples = 77,127

number of boxes = 567

number of apples in each box = 136

number of apples left unpacked = 15

$$\begin{array}{r} 136 \\ 567 \overline{) 77127} \\ \underline{-567} \\ 2042 \\ \underline{-1701} \\ 3417 \\ \underline{-3402} \\ 15 \end{array}$$

$$Q = 136 ; R = 15$$

There will be 136 apples in each box and 15 apples will be left unpacked.

Type 3: Example involving multiplication and division

Example 12: For a tree-plantation drive, 627 members of a club donated ₹145 each. If each sapling costs ₹319, then how many saplings did they buy for the drive?



Solution:

number of members =

amount contributed by each = ₹

total amount = ₹145 × 627 = ₹

cost of each sapling = ₹

number of saplings = ÷ 319 =

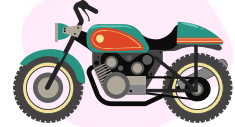
The members bought saplings.



Progress Meter 6

1. Solve the following number stories.

- (a) Shyamal took a loan of ₹46,242 and bought a bike. He needs to repay the amount in equal installments for 18 months. How much will he have to pay each month?



- (b) The employees of an organisation donated ₹95,950 towards a drought-relief fund. If there are 95 employees in the company, find the amount of money each employee contributed.

- (c) If 42,048 kg of sugar were packed in 876 sacks, what is the weight of sugar in each sack?



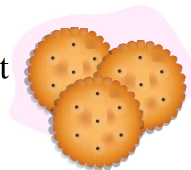
- (d) A shopkeeper wants to pack 29,442 biscuits. If he packs 14 biscuits in each box, how many such boxes will he need?

- (e) In a school, 11,060 candies are to be divided among 805 students. If each student gets an equal number of candies, find the number of candies each student will get. How many candies will be left?



- (f) A school ordered 15 packets of pens. Each packet had 72 pens in it. The pens were distributed equally among 54 teachers of the school. How many pens did each teacher receive?

- (g) There are 900 packets of biscuits contained in 45 cartons. If each packet holds 20 biscuits, then how many biscuits will be there in a carton?



- (h) A flood-relief camp collected ₹125 from each of 642 members of a club. The total amount collected was distributed equally among 75 people of a village. How much money did each villager receive?

- (i) Anil had 440 notes of ₹500. He deposited the amount in the bank and again withdrew the same amount. He received the amount in notes of ₹2,000. How many notes of ₹2,000 did he get?





Mental Maths

1. Solve the following.

a. $2,500 \times 400 =$

c. $12,000 \div 12 =$

e. $34,500 \times$ $= 3,45,000$

g. $7,89,000 \div 100 =$

i. $1,500 \times 1,500 =$

b. $50,000 \times 20 =$

d. $2 \times 19 \times 5 =$

f. $\times 1,000 = 7,61,000$

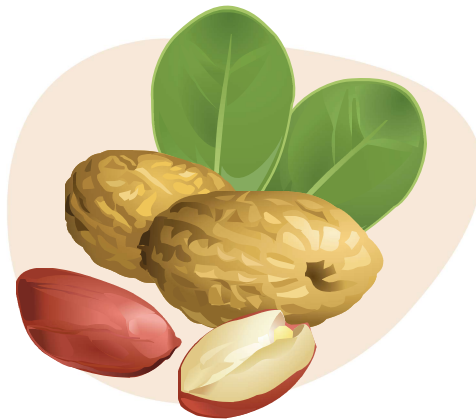
h. $600 \times 20 \times 50 =$

j. $62,500 \div 250 =$



Maths Connect

Groundnuts are popular throughout the world. We get peanut butter and groundnut oil from it. Groundnuts are also consumed as a confectionery snack. India is the second largest producer of groundnuts in the world.



- a. To produce 1 litre of groundnut oil, we require around 2,750 grams of groundnuts. Find the weight of groundnuts required to produce 25 litres of oil.
- b. If 31 litres of groundnut oil costs ₹9,641, what is the cost of 1 litre of oil?



Exercise

1. A Handloom Weavers' Cooperative Society received the following amount for completing an order.

Item	Amount (₹)
kurta	79,365
saree	99,385
dupatta	90,805
bed sheet	32,400
carpet	25,530

- (a) Find the number of dupatta(s) sold, if the cost of each dupatta is ₹635.
- (b) What is the cost of each saree, if a total of 55 sarees were sold?
- (c) If the number of kurtas sold equals the number of dupattas sold, then find the cost of each kurta.
- (d) How many bed sheets were sold, if each bed sheet costs ₹720?
- (e) Find the cost of each carpet, if 115 carpets were sold in all.
2. A shopkeeper brought some fruits to sell in the market. Observe the table given below and complete it.

Fruits	Cost per kg	Quantity	Total cost
mangoes	₹250	_____	₹1,750
apples	₹105	15 kg	_____
oranges	_____	13 kg	₹1,105
strawberries	_____	9 kg	₹3,150

3. Find a number, which when multiplied with 66 gives the product 39,996.

4. Choose the correct options.

a. Which operation will NOT change the value of any non-zero number?

i. dividing by 0

iii. adding 1

ii. multiplying with 0

iv. multiplying with 1

b. $1,397 \times 1,397 =$ _____

i. 19,51,609

ii. 19,81,709

iii. 18,62,619

iv. 20,31,719

c. $63,000 \div 21 =$ _____

i. 3

ii. 3,000

iii. 30,000

iv. 300

d. On multiplying 3,410 with 1,673, the product obtained is _____.

i. 5,04,930

ii. 5,74,930

iii. 57,04,930

iv. 54,07,930

e. Which digit should replace the ‘ * ’ ?

$$2,*2,608 \div 32 = 7,894$$

i. 7

ii. 6

iii. 0

iv. 5

f. $10,283 \times$ _____ $= 10,000 + 283$

i. 0

ii. 283

iii. 100

iv. 1

g. $18 \times 4 \times 250 =$ _____ $\times 18$

i. 100

ii. 1,000

iii. 400

iv. 2,500

h. $16 \times 8 \times 125 =$ _____ $\times 40$

i. 4

ii. 40

iii. 400

iv. 4,000



Think Class



1. Use the given rule to complete the following problems.

$$\text{dividend} = \text{divisor} \times \text{quotient} + \text{remainder}$$

- a. _____ = $322 \times 698 + 312$
- b. $49,525 =$ _____ $\times 521 +$ _____
- c. $86,245 = 66 \times$ _____ $+$ _____
- d. _____ = $245 \times 732 + 0$

2. Find the quotient when the greatest 5-digit number is divided by the greatest 2-digit number.

3. If $\Delta \div \square = 2$ and $\Delta \times \square = 32$, find Δ and \square .

4. Complete the pattern.

$$1 \times 1 = 1$$

$$11 \times 11 = 121$$

$$111 \times 111 = 12,321$$

$$1,111 \times 1,111 = \underline{\hspace{2cm}}$$

