6

We have already learnt that division is equal distribution of a given quantity. We also know that division is repeated subtraction of the same number look at the example given below:

For Example :

a.   27 apples are to be kept equally in 3 baskets. So, we put $27 \div 3$ apples in each basket. We put 9 apples in each basket. This is called an **equal sharing**.

$$27 \div 3 = 9$$

Dividend   Divisor   Quotient

The number to be divided is called the dividend.

The number by which we divide is called the divisor and the answer to a division sum is called the quotient.

b.   Division is also called **repeated subtraction**. How many fours are there in 12 ?

```
  1 2
 − 4    1
 ─────
   8
 − 4    2
 ─────
   4
 − 4    3
 ─────
   0
```

We can subtract 4 from 12, three times. So, there are 3 fours in 12. This is the same as $12 \div 4 = 3$.

Dividend   Divisor   Quotient

c.   The number which is left over after division is known as **remainder**.

Example I : Divide 67 by 7.

Solution : $67 \div 7$

$$
\begin{array}{r}
9 \\
7\overline{)\ 6\ 7} \\
-\ 6\ 3 \\
\hline
4
\end{array}
$$

That is $67 \div 7$ gives Quotient 9, Remainder 4.

In this division, 67 is called the dividend.

7 is called the divisor.

9 is called the quotient.

and 4 is called the remainder.

Now, $67 \div 7 =$ 9   ×   7   +   4   =   67

quotient   divisor   remainder   =   dividend

Exercise 6.1

1. The dividend, divisor and quotient are given for each of the following. Write the division fact.

	Dividend	Divisor	Quotient	Division fact
a.	50	10	5	....
b.	54	6	9	....
c.	36	9	4	....
d.	60	6	10	....
e.	63	9	7	....
f.	40	5	8	....

2. Write the division fact in the box given below for each of the following.

a.
$$\begin{array}{r} 24 \\ -6 \\ \hline 18 \\ -6 \\ \hline 12 \\ -6 \\ \hline 6 \\ -6 \\ \hline 0 \end{array}$$

b.
$$\begin{array}{r} 40 \\ -8 \\ \hline 32 \\ -8 \\ \hline 24 \\ -8 \\ \hline 16 \\ -8 \\ \hline 8 \\ -8 \\ \hline 0 \end{array}$$

c.
$$\begin{array}{r} 60 \\ -10 \\ \hline 50 \\ -10 \\ \hline 40 \\ -10 \\ \hline 30 \\ -10 \\ \hline 20 \\ -10 \\ \hline 10 \\ -10 \\ \hline 0 \end{array}$$

3. Solve the following by repeated subtraction in your notebook.

a. $30 \div 5$ b. $50 \div 10$ c. $56 \div 7$ d. $25 \div 5$

Properties of Division

Property 1 : If a number is divided by 1, then the quotient is the number itself.

Example II : Find out the value of $3 \div 1$.

Solution : Apply the repeated method of subtraction.

1st step $\rightarrow$ $3 - 1 = 2$

2nd step $\rightarrow$ $2 - 1 = 1$

3rd step $\rightarrow$ $1 - 1 = 0$

Therefore, 1 is subtracted from 3, three times or

$3 \div 1 = 3$.

Property 2 : No number can be divided by zero (0).

Example III: Find the value of $18 \div 0$.

Solution : Apply the repeated method of subtraction.

1st step $\rightarrow$ $18 - 0 = 18$

2nd step $\rightarrow$ $18 - 0 = 18$

3rd step $\rightarrow$ $18 - 0 = 18$

Here, by subtracting 0 from 18 any number of times, the same number 18 is obtained, therefore, 18 can not be divided by zero.

Property 3 : If zero (0) is divided by any number, then it gives zero as quotient.

Example IV : Find the value of $0 \div 9$.

Solution : Apply the repeated method of subtraction. Since zero means nothing, therefore, any number cannot be subtracted from zero.

or $0 \div 9 = 0$

Property 4 : If a number except 0 is divided by itself, then the quotient is 1.

Example V : Find the value of $6 \div 6$.

Solution : Apply the repeated method of subtraction.

1st step $\rightarrow$ $6 - 6$

Here, 6 is subtracted from 6 one time or $6 \div 6 = 1$.

1. **Write the quotient for each of the following division sums.**

   a. $586 \div 1$ = ...   b. $5923 \div 1$ = ...

   c. $6999 \div 6999$ = ...   d. $498 \div 498$ = ...

   e. $0 \div 898$ = ...   f. $0 \div 9999$ = ...

2. **Fill in the blanks.**

   a. $4978 \div 4978$ = ...   b. .... $\div 84532$ = 0

   c. .... $\div 6870$ = 1 d. .... $\div 1$ = 8906

   e. $91540 \div$ .... = 91540 f. .... $\div 87253$ = 0

The Remainder

What is a remainder ? Let us see a few examples of division with remainder.

For Example : There are 14 apples. One plate can hold 6 apples. How many plates are needed so that each plate holds an equal number of apples? Two plates.

You can see that 2 apples are left over. The number of left over apples is called the remainder.

Example VI : How many fives are there in 28?

Solution : Let us subtract.

$$
\begin{array}{r}
2\,8 \\
-\ 5 \longrightarrow 1 \\
\hline
2\,3 \\
-\ 5 \longrightarrow 2 \\
\hline
1\,8 \\
-\ 5 \longrightarrow 3 \\
\hline
1\,3 \\
-\ 5 \longrightarrow 4 \\
\hline
8 \\
-\ 5 \longrightarrow 5 \\
\hline
3 \longrightarrow \text{Remainder}
\end{array}
$$

Facts to Know

- ❖ The number left over after subtracting one number from another repeatedly is called the remainder.

We can subtract 5 from 28 repeatedly 5 times, but 3 is left over. So, 3 is the remainder.

Sometimes when we divide a number by another number, we get a remainder.

Long Division

Let us work out division in another way. This is called the long division.

Example VII :   Divide 66 by 9.

Solution   :   You know that $7 \times 9 = 63$, which is less than 66.

So, write 7 in the quotient and subtract 63 from 66.

```
              T O
                7   ←—— Quotient
Divisor  ←—— 9 ) 6 6   ←—— Dividend
              − 6 3
              ———————  ←—— Remainder
                  3
```

Facts to Know

❖ In each step, the remainder will be smaller than the divisor.
❖ When the divisor cannot divide the digit in the higher place in the dividend, we leave the place empty in the quotient.

Checking Division

We can check every long division question.

If Dividend = (Divisor × Quotient) + Remainder, then the division problem has been correctly solved. In the division sum (example VII), let us check this out.

Dividend = 66   Divisor = 9   Quotient = 7   Remainder = 3

Verification

Divisor × Quotient + Remainder
$= 9 \times 7 + 3 = 63 + 3 = 66$
= Dividend (verified)

1.   **Divide by the long division method and find the quotient.**

   a. 18 ÷ 6   b. 28 ÷ 7   c. 48 ÷ 8   d. 81 ÷ 9   e. 40 ÷ 5
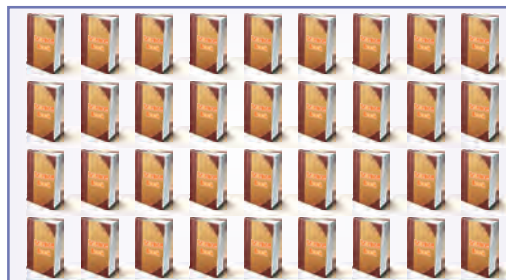
2.   **Divide each of the following into groups as directed and fill in the blanks.**

   a. **Groups of 5**   b. **Groups of 4**

   .... groups   .... groups

   .... pens left over   .... books left over

   c. **Groups of 7**   d. **Groups of 8**

   .... groups   .... groups
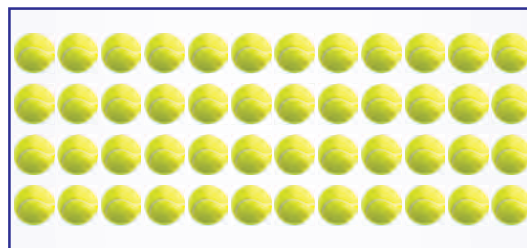
   .... flowers left over   .... balls left over

3.   **Divide and find the quotient and remainder for each of the following.**

   a.   58 ÷ 8   b.   40 ÷ 6   c.   48 ÷ 9   d.   36 ÷ 5

4.   **Divide and find the quotient and remainder. Also verify the answer.**

   a.   43 ÷ 6   b.   30 ÷ 7   c.   26 ÷ 4   d.   28 ÷ 8

Division of 3-digit Number by 1-digit Number

Example VIII : Divide 817 by 6 and check that answer.

Solution : Arrange the division.

Step 1 : Here, hundreds place 8 > 6.

Hence, recall 6's table for 8.

$1 \times 6 = 6 < 8$ and $2 \times 6 = 12 > 8$

Hence, 6 divides 8 for 1 time.

Write 1 at the quotient place and 6 below 8.

Subtract $8 - 6 = 2$

Write 2 below 6.

```
        H  T  O
        1  3  6
   6 ) 8  1  7
     − 6  ↓
        2  1
      − 1  8
         3  7
       − 3  6
            1
```

Step 2 : Now, 2 < 6. So, bring down 1. Recall 6's table for 21.

$3 \times 6 = 18 < 21$ and $4 \times 6 = 24 > 21$. Hence, 6 divides 21 for 3 times. Write 3 at the quotient place and 18 below 21 and subtract $21 - 18 = 3$.

Write 3 below 18.

Step 3 : Now, 3 < 6. So, bring down 7. Recall 6's table for 37.

$6 \times 6 = 36 < 37$ and $7 \times 6 = 42 > 37$. Hence, 6 divides 37 for 6 times. Write 6 at quotient place and 36 below 37 and subtract.

$37 - 36 = 1$. As 1 < 6, there is no digit in the dividend to bring down.

Therefore, 1 is the remainder.

Thus, dividing 817 by 6 give 136 as quotient and 1 as remainder.

Answer : Quotient (Q) = 136, Remainder (R) = 1

To check the answer :

Divisor × Quotient + Remainder = Dividend

Here (divisor × quotient) + remainder = 6 × 136 + 1

$$= 816 + 1$$
$$= 817 = Dividend$$

Hence, the answer is correct.

Exercise 6.4

1. Divide the following.

a. 637 ÷ 7   b. 656 ÷ 8   c. 468 ÷ 6   d. 135 ÷ 9

e. 372 ÷ 4   f. 963 ÷ 3

2. Find the quotient, remainder and verify the answer.

a. 274 ÷ 4   b. 285 ÷ 2   c. 239 ÷ 7   d. 293 ÷ 3

e. 498 ÷ 5   f. 369 ÷ 8

3. Put the appropriate sign +, × or ÷ in the box.

a. 300 ☐ 4 = 75 ☐ 2 = 150   b. 412 ☐ 2 = 206 ☐ 2 = 103

c. 618 ☐ 3 = 206 ☐ 6 = 200   d. 321 ☐ 8 = 329 ☐ 329 = 0

e. 17 ☐ 9 = 153 ☐ 3 = 459   f. 11 ☐ 11 = 121 ☐ 21 = 100

Division of 4-digit Number by 1-digit Number

Example IX   :   Divide 3678 by 3 using long division method.

Solution   :   Arrange the division.

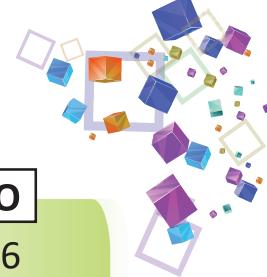**Step 1   :**   Divide the thousand's place digit 3.

Recall 3's table for 1 × 3 = 3.

Write 1 at the quotient's place and

3 below 3 and subtract 3 − 3 = 0.

Step 2 : Bring down hundred's place digit 6
Recall 3's table for 6, $2 \times 3 = 6$.
Write 2 at the quotient's place and
6 below 6 and subtract $6 - 6 = 0$.

Step 3 : Bring down the ten's place digit 7.
Recall 3's table for 7.
$2 \times 3 = 6 < 7$ and $3 \times 3 = 9 > 7$, hence,
3 divides 7 for 2 times.
Write 2 at quotient's place and 6
below 7 and subtract
$7 - 6 = 1$.

Step 4 : Bring down one's place digit 8.
Recall 3's table for 18.
$6 \times 3 = 18$
Write 6 at quotient's place and 18 below 18 and subtract
$18 - 18 = 0$.
Now, there is no digit in the dividend to bring down.
Therefore, $3678 \div 3 = 1226$ as quotient and 0 as remainder.

Answer: Quotient (Q) =   1226
Remainder (R)   =   0

```
   Th  H  T  O
       1  2  2  6
3)     3  6  7  8
      -3
       ─────────
       0  6
         - 6
         ────────
          0  7
            - 6
            ──────
             1  8
           - 1  8
           ───────
                0
```

If a number is divided by 10, then the digit at ones place of that number will be the remainder and the rest of the number will be the quotient.

Division of 4-digit Number by 2-digit Number

Example X : Divide 989 by 10.
Solution :

```
        H  T  O
           9  8
10)     9  8  9
       -9  0
       ────────
           8  9
         - 8  0
         ───────
              9
```

Therefore, Quotient   =   98
Remainder   =   9

If a number is divided by 100, then the last two digits of that number will be the remainder and rest of the number will be the quotient.

Division of 4-digit Number by 3 and 4-digit Number

Example XI : Divide 6362 by 100.

Solution :

$$
\begin{array}{r}
6\ 3 \\
100\overline{)\ 6\ 3\ 6\ 2} \\
-6\ 0\ 0 \\
\hline
3\ 6\ 2 \\
-\ 3\ 0\ 0 \\
\hline
\times 6\ 2
\end{array}
$$

Therefore, Quotient = 63

Remainder   = 62

If a number is divided by 1000, then the last three digits of that number will be the remainder and the rest of the number will be the quotient.

Example XII : Divide 6269 by 1000.

Solution :

$$
\begin{array}{r}
6 \\
1000\overline{)\ 6\ 2\ 6\ 9} \\
-6\ 0\ 0\ 0 \\
\hline
\times\ 2\ 6\ 9
\end{array}
$$

Therefore, Quotient = 6

Remainder   = 269

Exercise 6.5

1. **Divide the following.**

a.   7380 ÷ 9   b.   3168 ÷ 3   c.   9696 ÷ 8

d.   8636 ÷ 4   e.   5430 ÷ 5   f.   7357 ÷ 7

2. **Find the remainder in each of the following case.**

a.   3489 ÷ 7   b.   9323 ÷ 9   c.   3463 ÷ 2

d.   6572 ÷ 3   e.   4329 ÷ 4   f.   4689 ÷ 6

3. **Find the quotient in each of the following case.**

a.   5096 ÷ 7   b.   4698 ÷ 6   c.   3084 ÷ 4

d.   6426 ÷ 3   e.   6957 ÷ 9   f.   4262 ÷ 2

4. **Find the quotient and remainder in each case.**

a.   3279 ÷ 7   b.   2242 ÷ 6   c.   4346 ÷ 8

d.   2678 ÷ 5   e.   3828 ÷ 9   f.   3037 ÷ 4

5. **Divide the following and write quotient and remainder.**

     a.   6300 ÷ 9   b.   8462 ÷ 3   c. 6600 ÷ 5

     d.   2428 ÷ 4   e.   3460 ÷ 2   f. 2000 ÷ 4

Word Problems

Example XIII: 1200 lilies are put in 30 baskets. How many lilies are there in each basket ?

Solution   **:** Total number of lilies = 1200

                Number of baskets = 30

                Number of lilies in each basket = 1200 ÷ 30

                Therefore, each basket has 40 lilies.

                Answer : 40 lilies

```
        4 0
30) 1 2 0 0
   −1 2 0 ↓
    × × × 0
       − 0
         ×
```

Example XIV : 6 plane carry a total number of 894 passengers. How many passengers are there in each plane ?

Solution   **:** Total number of passengers = 894

                Number of planes = 6

                Number of passengers in each plane = 894 ÷ 6

                Therefore, Number of passengers in each plane is 149.

                Answer : 149 passengers in each plane

```
      1 4 9
6) 8 9 4
  − 6
    2 9
  − 2 4
      5 4
    − 5 4
     × ×
```

Exercise 6.6

1. There is total 4284 kg of wheat in different bags. If each bags contains 7 kg, how many bags are there ?

2. There are 3879 toffees in 9 big jars. How many toffees are there in each jar?

3. A total of 6280 passengers are travelling in 8 planes. How many passengers can each plane carry ?

4. 6 crayons can be packed in a packet. How many packets are needed to pack 546 crayons?

5. How many weeks are there in 364 days ?

6. 7 televisions cost ₹ 2751. Find out the cost of one television.

7. Divide 880 by 4 and multiply the quotient by 3, then find the answer.

8. In a division, the divisor is 12, the quotient is 46 and remainder is 8. Find the dividend.

Points to Remember

❖ Division means equal sharing and equal grouping.

❖ When we divide any number by 1, the answer is the number itself.

❖ When we divide any number by itself, the answer is always 1.

❖ When we divide 0 by any number, the answer is 0. (Division by 0 is not possible).

❖ We can check division problems as Dividend = Divisor × Quotient + Remainder.

❖ When we divide a number by 10, the quotient is obtained by removing the digit at the ones place from the number, the digit at the ones place is the remainder.

EXERCISE

1. **Multiple Choice Questions (MCQs)**
   Tick (✓) the correct option.

   a. When we divide any number by 1, it gives the quotient as ....

   (i) 0   (ii) number itself

   (iii) 1   (iv) none of these

   b. If quotient = 42, divisor = 16, remainder = 2, then dividend is ....

   (i) 670   (ii) 672

   (iii) 668   (iv) 674

c. The answer in division is called ....
(i) dividend   (ii) divisor
(iii) quotient   (iv) none of these

d. If a number except 0 is divided by itself, then the quotient is ....
(i) 0   (ii) 1
(iii) 100   (iv) none of these

e. $6975 \div 0$ is equal to ....
(i) 0   (ii) 8925
(iii) meaningless   (iv) none of these

2. **Solve each of the following through the long division method.**
   a. $1278 \div 9$ b. $4424 \div 8$ c. $3600 \div 12$ d. $2240 \div 4$

3. **Find the quotient and remainder for each of the following.**
   a. $5329 \div 7$ b. $279 \div 4$ c. $468 \div 5$ d. $1388 \div 6$

4. **Divide each of the following. Verify the answer.**
   a. $348 \div 8$ b. $99 \div 4$ c. $193 \div 3$ d. $758 \div 9$

5. **Solve the following word problems.**
   a. The product of two numbers is 1440. One number is 32. Find the other number.
   b. 6 photographs can be displayed on a chart paper. How many chart papers will be needed to display 276 photographs ?
   c. A box can contain 8 toys. How many boxes will be needed to keep 3745 toys? How many toys will be left over ?

HOTS There were 2339 tyres in a shop. 4 tyres were used in each car. How many cars would get tyres and how many tyres would be remaining ?

DIVISION AS REPEATED SUBTRACTION

Objective : To use repeated subtraction to find the quotient.

Materials Required : A measuring tape, child scissors and a roll of rope or string

Process :

Students may works in pairs.

To find $64 \div 4$.

❖ One student measures and cuts out a length of rope 64 cm long.

❖ Starting at one end of the rope, the students take turns in measuring out 4 cm pieces and cutting it.

❖ They count how many 4 cm pieces they have.

❖ They find they have 16 pieces.

❖ They record the activity as $64 \div 4 = 16$.

Record of the Activity :

Length of rope	Cut into lengths	No. of pieces
64 cm	4 cm	16
72 cm	8 cm	
220 cm	10 cm	
90 cm	15 cm	
100 cm	25 cm	