2 THE FOUR OPERATIONS

Warm Up

A. Fill in the blanks. ANS

quotient   dividend   sum   factors   product   difference   divisor

1. $3272 + 4590 = 7862$. 7862 is called the _____
2. $7862 - 3272 = 4590$. 4590 is called the _____
3. $125 \times 50 = 6250$. 6250 is called the _____ and 125 and 50 are called the _____
4. $6250 \div 125 = 50$. 6250 is the _____, 125 is the _____ and 50 is the _____

B. Match the columns. ANS

1. There are 2564 boys and 1583 girls in a school. Find the total number of students.	a. multiply ($\times$)	i. 262922
2. 600 pencils are placed equally in 25 boxes. Find the number of pencils in each box.	b. add ($+$)	ii. 24
3. One bicycle costs ⊏3599. Find the cost of 16 such bicycles.	c. subtract ($-$)	iii. 4147
4. The population of a town is 456600. Out of these, 193678 are females. Find the number of males.	d. divide ($\div$)	iv. ⊏57584

ADDITION AND SUBTRACTION

Addition

Numbers can be added in any order. Their sum will remain the same. $3105 + 2692 = 5797$ $2692 + 3105 = 5797$	When 1 is added to a number, the sum is the successor (the number after). $8670 + 1 = 8671$	When 0 is added to a number, the sum is the number itself. $9878 + 0 = 9878$ $0 + 9878 = 9878$

8671 is the successor of 8670.

Addition of large numbers is the same as addition of small numbers.

EXAMPLE 1 Add 23408 and 62897.

```
  TTh Th H  T  O
      1  1  1
   2  3  4  0  8
+  6  2  8  9  7
   8  6  3  0  5
```

Start adding from the ones place. Regroup if necessary.

ANS. 86305

EXAMPLE 2 Add 754073, 8249 and 37398.

```
  L  TTh Th  H  T  O
         1      2  2
   7  5  4  0  7  3
         8  2  4  9
+     3  7  3  9  8
   7  9  9  7  2  0
```

ANS. 799720

Subtraction

When 0 is subtracted from a number, the difference is the number itself. $4058 - 0 = 4058$	When 1 is subtracted from a number, the difference is the predecessor (the number before). $6214 - 1 = 6213$	When a number is subtracted from itself, the difference is always 0. $5769 - 5769 = 0$

6213 is the predecessor of 6214.

Subtraction of large numbers is the same as subtraction of small numbers.

EXAMPLE 3 Subtract 2745 from 6518. Use addition to check.

```
   Th H  T  O        Checking    Th H  T  O
   5  14 11                      1  1
   6  5  1  8                    3  7  7  3
-  2  7  4  5                 +  2  7  4  5
   3  7  7  3                    6  5  1  8
```

Start subtracting from the ones place. Regroup if necessary. We can use addition to check.

ANS. 3773

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EXAMPLE 4 Subtract 153852 from 203291. Use addition to check.

```
   L  TTh Th  H  T  O    Checking   L  TTh Th  H  T  O
      9
   1  10  12 12  8  11                  1  1  1      1
   2   0   3  2  9   1               +     4  9  4  3  9
-  1   5   3  8  5   2               +  1  5  3  8  5  2
   4   9   4  3  9                      2  0  3  2  9  1
```

ANS. 49439

Exercise 2.1

A. Find the sum. ANS

1. $65758 + 79899$ _____
2. $94976 + 99758$ _____
3. $53428 + 7346 + 989$ _____
4. $277054 + 35570$ _____
5. $321977 + 44698 + 5489$ _____
6. $63546 + 84794 + 386256$ _____

B. Find the sum of the largest and the smallest 5-digit number. ANS

C. Find the difference. ANS

1. $87654 - 8765$ _____
2. $97320 - 68351$ _____
3. $30052 - 12345$ _____
4. $630105 - 5815$ _____
5. $991352 - 11352$ _____
6. $771122 - 580403$ _____

D. Fill in the missing digits. ANS

```
1.     5  6  8  4          2.     9  3  4  2  1       3.     4  5  2  □  1
    +  6  7  3  1  □          +  □  1  1  4  3          +  2  4  □  5  2
    1  2  4  1  6  1          1  1  4  □  6  4          6  □  5  4  3

4.     2  1  □  3  0        5.     3  4  2  1  5       6.     9  8  4  5  0
    -  1  9  2  4  1          -  2  0  □  4  2          -     2  □  1  4
       2  4  8  9            1  3  5  □  3             6  □  8  3  6
```

E. Solve. ANS

1. $343257 + 4068 - 15938$
2. $774891 - 62340 + 17389$
3. $358689 - 8748 + 397045$
4. $9915521 - 6405 + 858$

Carry out addition first and then subtract.

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EXAMPLE 5 A merchant had 78,534 sacks of potatoes. He sold 3,748 sacks on Monday and 5,637 sacks on Tuesday. How many sacks did he sell in all on these two days? How many sacks were left?

Number of sacks sold on Monday = 3,748
Number of sacks sold on Tuesday = 5,637
Number of sacks sold on these two days = 3,748 + 5,637
= 9,385

$$\begin{array}{r} 3\ 7\ 4\ 8 \\ +\ 5\ 6\ 3\ 7 \\ \hline 9\ 3\ 8\ 5 \end{array}$$

Number of sacks left = Total number of sacks –
Number of sacks sold
= 78,534 – 9,385
= 69,149

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

ANS. 9,385 sacks were sold in all and 69,149 sacks were left.

EXAMPLE 6 The distance between two planets is 3,50,000 km. A spaceship travelling between the planets has covered 1,05,342 km. What distance is left for it to travel?

Total distance between the two planets = 3,50,000 km
Distance covered by the spaceship = 1,05,342 km
Distance left to be travelled = 3,50,000 km – 1,05,342 km
= 2,44,658 km

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

ANS. Distance left to be travelled
is 2,44,658 km.

Exercise 2.2

Solve these story sums. **ANS**

1. A school library had 66,500 books. 8,947 books were issued to the students and 4,033 to the teachers. How many books are still in the library?

2. Mrs Patnaik bought a laptop for ₹42,555 and a refrigerator that was priced ₹7,920 less than the laptop. How much did she pay for both?

3. There are 55,299 honeybees in a beehive. On Monday, 4,684 bees went out in the morning looking for flowers. 3,276 bees went out in the afternoon. How many bees went out looking for flowers on Monday? How many bees did not leave the beehive on Monday?

4. Mary takes a loan of ₹80,00,000 from a bank to buy a house. If she also pays ₹7,00,000 from her own savings, how much does the house cost?

MULTIPLICATION AND DIVISION

Multiplication

Numbers can be multiplied in any order. The product will remain the same. $392 \times 9 = 9 \times 392 = 3528$	When a number is multiplied by 1, the product is the number itself. $508 \times 1 = 508$	When a number is multiplied by 0, the product is 0. $734 \times 0 = 0$

Large numbers are multiplied in the same way as small numbers.

EXAMPLE 7 Multiply 4527 by 8.

$$\begin{array}{c} \text{Th H T O} \\ 4\ 2\ 5 \\ 4\ 5\ 2\ 7 \\ \times\ \ \ \ \ \ 8 \\ \hline 3\ 6\ 2\ 1\ 6 \end{array}$$

ANS. 36216

EXAMPLE 8 Multiply 3247 by 36.

$$\begin{array}{c} \text{Th H T O} \\ 3\ 2\ 4\ 7 \\ \times\ \ \ \ 3\ 6 \rightarrow 30 + 6 \\ \hline 1\ 9\ 4\ 8\ 2 \leftarrow 3247 \times 6 \\ +\ 9\ 7\ 4\ 1\ 0 \leftarrow 3247 \times 30 \\ \hline 1\ 1\ 6\ 8\ 9\ 2 \end{array}$$

ANS. 116892

EXAMPLE 9 Multiply 752 by 308.

$$\begin{array}{c} \text{H T O} \\ 7\ 5\ 2 \\ \times\ \ 3\ 0\ 8 \rightarrow 300 + 0 + 8 \\ \hline 6\ 0\ 1\ 6 \leftarrow 752 \times 8 \\ 0\ 0\ 0\ 0 \leftarrow 752 \times 0 \\ +\ 2\ 2\ 5\ 6\ 0\ 0 \leftarrow 752 \times 300 \\ \hline 2\ 3\ 1\ 6\ 1\ 6 \end{array}$$

ANS. 231616

EXAMPLE 10 Multiply 5378 by 690.

Number × 0 = 0, so we can exclude this step

$$\begin{array}{c} \text{Th H T O} \\ 5\ 3\ 7\ 8 \\ \times\ \ \ 6\ 9\ 0 \\ \hline 0\ 0\ 0\ 0 \\ 4\ 8\ 4\ 0\ 2\ 0 \\ +\ 3\ 2\ 2\ 6\ 8\ 0\ 0 \\ \hline 3\ 7\ 1\ 0\ 8\ 2\ 0 \end{array}$$

ANS. 3710820

Multiplying a number by multiples of 10

To multiply a number by 10, 100, 1000, ..., write one, two, three, ... zeros, respectively, at the end of the product.

EXAMPLE 11 Multiply a. 23 by 100   b. 916 by 300

a. $23 \times 100 = 2300$ b. $916 \times 300 = 274800$

🐝 ANS. 2300   🐝 ANS. 274800

EXAMPLE 12 Multiply a. 42 by 1000   b. 105 by 6000

a. $42 \times 1000 = 42000$ b. $105 \times 6000 = 630000$

🐝 ANS. 42000   🐝 ANS. 630000

I Can Do It!

A. Complete the circle. ANS

100 × 5496 ÷ 8 ... 21,984

B. Multiply. ANS

1. 4629×7 _____
2. 5846×9 _____
3. 2258×36 _____
4. 9060×40 _____
5. 7642×401 _____
6. 1345×512 _____

C. Type the product. ANS

1. $118 \times 200 =$ _____
2. $111 \times 500 =$ _____
3. $4321 \times 300 =$ _____
4. $4121 \times 9000 =$ _____
5. $6401 \times 100 =$ _____
6. $246 \times 8000 =$ _____

Division

When a number is divided by 1, the quotient is the number itself.	When 0 is divided by a number, the quotient is 0.	When a number is divided by itself, the quotient is 1.
$36 \div 1 = 36$	$0 \div 36 = 0$	$36 \div 36 = 1$
$999 \div 1 = 999$	$0 \div 999 = 0$	$999 \div 999 = 1$

Large numbers are divided in the same way as small numbers.

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EXAMPLE 13 Divide 825 by 3 and check your answer.

```
      2 7 5
3 ) 8 2 5
  - 6
    2 2
  - 2 1
      1 5
    - 1 5
        0
```

Checking

Quotient × Divisor + Remainder = Dividend

$275 \times 3 + 0 = ?$

```
    2 7 5
  ×     3
  8 2 5  + 0 = 825 (Dividend)
```

🐝 ANS. Q = 275, R = 0

EXAMPLE 14 Divide 77218 by 35 and check your answer.

```
        2 2 0 6
35 ) 7 7 2 1 8
   - 7 0
       7 2
     - 7 0
         2 1
       -   0
         2 1 8
       - 2 1 0
             8
```

Checking

Quotient × Divisor + Remainder = Dividend

$2206 \times 35 + 8 = ?$

```
    2 2 0 6
  ×     3 5
  1 1 0 3 0
+ 6 6 1 8 0
  7 7 2 1 0  + 8 = 77218 (Dividend)
```

🐝 ANS. Q = 2206, R = 8

EXAMPLE 15 Divide 51326 by 245 and check your answer.

```
          2 0 9
245 ) 5 1 3 2 6
    - 4 9 0
        2 3 2
      -     0
        2 3 2 6
      - 2 2 0 5
            1 2 1
```

Checking

Quotient × Divisor + Remainder = Dividend

$209 \times 245 + 121 = ?$

```
      2 0 9
  ×   2 4 5
  1 0 4 5
  8 3 6 0
+ 4 1 8 0 0
  5 1 2 0 5  + 121 = 51326 (Dividend)
```

🐝 ANS. Q = 209, R = 121

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Exercise 2.3

A. Find the product. ANS

1. 4258×36
2. 1608×29
3. 5097×43
4. 352×416
5. 654×308
6. 1325×613
7. 2035×480
8. 5826×109

B. Divide and check your answer in your notebook. ANS

1. $12686 \div 9$
2. $4987 \div 16$
3. $3005 \div 18$
4. $16254 \div 23$
5. $3179 \div 25$
6. $40120 \div 32$
7. $20045 \div 22$
8. $1647 \div 125$

STORY SUMS

EXAMPLE 16 A set of books costs ₹1,459. A school ordered 375 such sets. How much did the school pay?

Cost of 1 set of books = ₹ 1,459

Cost of 375 sets ordered by the school = ₹1,459 × 375

= ₹5,47,125

```
    1  4  5  9
 ×     3  7  5
 ─────────────
    7  2  9  5
 1  0  2  1  3  0
+4  3  7  7  0  0
 ─────────────
 5  4  7  1  2  5
```

😃 ANS. The amount paid by the school is ₹5,47,125.

EXAMPLE 17 Mala's annual income is ₹5,34,250. She spends ₹4,80,250 and saves the rest. How much money does she save monthly if she saves an equal amount every month?

Mala's annual income = ₹5,34,250

Amount she spends = ₹4,80,250

Amount she saves = ₹5,34,250 − ₹4,80,250

= ₹54,000

```
   5  3  4  2  5  0
 − 4  8  0  2  5  0
 ──────────────────
   5  4  0  0  0
```

```
          4 5 0 0
    12 ) 5 4 0 0 0
        − 4 8
        ──────
            6 0
          − 6 0
          ──────
            0 0
          − 0
          ──────
              0
            − 0
            ──────
              0
```

Amount she saves every month = ₹54,000 ÷ 12

= ₹4,500

😃 ANS. Mala saves ₹4,500 every month.

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Exercise 2.4

Solve these story sums. ANS

1. A class of 16 students went on a trip to Jaipur. The school spent ₹12,984 on the trip in all. How much did each student contribute if the school contributed ₹5784?

2. There are 98,800 books in a library. How many shelves are there in the library if 400 books can be kept on 4 shelves?

3. Mrs Kalam earns ₹10,250 every month. How much money does she earn in two years?

4. In Mr Singh's orchard, there are 125 rows of apple trees with 28 trees in each row. How many apple trees are there altogether?

5. Mr Singh ordered 4680 apple tree saplings. He wants to plant them in 18 rows. How many of them should he plant in each row?

6. There are 11,050 raw apples. The number of ripe apples is twice the number of raw apples. Mr Singh packs an equal number of ripe apples in 850 boxes. How many ripe apples will each box contain?
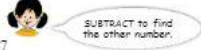

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WHICH OPERATION?

EXAMPLE 18 The sum of two numbers is 342. If one number is 195, find the other one.
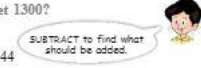
195 + the number = 342

the number = 342 − 195 = 147 🐞 ANS. 147

SUBTRACT to find the other number.

EXAMPLE 19 What should be added to 756 to get 1300?

756 + the number = 1300

the number = 1300 − 756 = 544 🐞 ANS. 544

SUBTRACT to find what should be added.

EXAMPLE 20 The product of two numbers is 144. If one number is 6, find the other one.

6 × the number = 144

the number = 144 ÷ 6 = 24 🐞 ANS. 24

DIVIDE to find the other number.

EXAMPLE 21 A number when multiplied by 7 gives 91 as the product. Find the number.

7 × the number = 91

the number = 91 ÷ 7 = 13 🐞 ANS. 13

DIVIDE to find the number.

EXAMPLE 22 By which number should 84 be divided to get 6 as the quotient?

84 ÷ the number (divisor) = 6 (quotient)

the number = 84 ÷ 6 = 14 🐞 ANS. 14

DIVIDE to find the number (divisor).

EXAMPLE 23 A number when divided by 8 gives the quotient 9. Find the number.

the number (dividend) ÷ 8 = 9 (quotient)

the number = 9 × 8 = 72 🐞 ANS. 72

MULTIPLY to find the number (dividend).
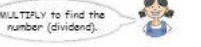
Exercise 2.5

🔊 Solve these story sums. **ANS**

1. What should be added to 6480 to get 10583?
2. The sum of two numbers is 16597. If one number is 9597, find the other number.

3. What should be added to 17526 to get 30000?
4. The product of two numbers is 6025. If one number is 25, find the other number.
5. A number when multiplied by 13 gives 1820 as the product. Find the number.
6. By what number should 153 be divided to get 9 as the quotient?
7. A number when divided by 13 gives the quotient 109. Find the number.

THE FOUR OPERATIONS TOGETHER

When there is more than one operation in a question, follow the rule of DMAS to find the answer.

D M A S

Division

Multiplication

Addition

Subtraction

EXAMPLE 24 Simplify 10 + 8 ÷ 4 − 2 × 6.

10 + **8 ÷ 4** − 2 × 6	DIVIDE	8 ÷ 4 = 2
10 + 2 − **2 × 6**	MULTIPLY	2 × 6 = 12
10 + 2 − 12	ADD	10 + 2 = 12
12 − 12 = 0	SUBTRACT	12 − 12 = 0

🐞 ANS. 0
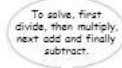
EXAMPLE 25 Simplify 30 − 14 ÷ 7 × 5.

30 − **14 ÷ 7** × 5	DIVIDE	14 ÷ 7 = 2
30 − **2 × 5**	MULTIPLY	2 × 5 = 10
30 − 10 = 20	SUBTRACT	30 − 10 = 20

🐞 ANS. 20

To solve, first divide, then multiply, next add and finally subtract.

Exercise 2.6

🔊 Simplify. **ANS**

1. 8 + 12 − 6 × 2
2. 4 × 5 + 30 ÷ 5
3. 3 + 40 ÷ 10 − 3
4. 14 + 7 × 2 − 16 ÷ 2
5. 2 + 4 × 6 − 2 × 6
6. 20 × 5 − 100 ÷ 100
7. 8 + 20 ÷ 5 − 0 ÷ 3
8. 75 × 0 − 0 ÷ 75
9. 39 − 0 + 5 × 999

Maths Lab Activity

Aim: To demonstrate the magic of 1089

You will need: Your notebook and a pencil

Preparation: Work in pairs.

Steps

- Choose a 3-digit number in which the digit in the hundreds place is greater than the digit in the ones place. This is number A.
- Reverse the order of the digits. You will get number B. Subtract B from A. Write the difference. This is number C.
- Then reverse the order of the digits of number C. You will get number D. Add C and D. What is the answer?
- Give one another some numbers to work with, such as 413, 682, 564, 321, 938, 713 and 160.

What do you observe about the answer?

Example:

```
    7 2 1   A
 -  1 2 7   B
 ---------
    5 9 4   C
 +  4 9 5   D
 ---------
  1 0 8 9
```

Life Skills

Mrs Rao uses a water filter in which 15 litres of water is wasted every day. Help her to use this water. **ANS**

- 4 L to water the plants   ·   2 L to soak clothes   ·   5 L to wash the car

1. Total water used = _____; water left = _____.
2. Water needed for plants for 365 days = _____.
3. Left over water poured equally in 2 bowls for birds. Each bowl will have _____ L.

Mental Maths

A. The product of a 2-digit number and a 3-digit number cannot be more than (2 + 3) = 5 digits. Fill in the blanks. **ANS**

1. The product of two 3-digit numbers cannot be more than (____ + ____) = _____ digits.
2. The product of a 3-digit number and a 4-digit number cannot be more than (____ + ____) = _____ digits.

B. Complete the division grid. **ANS**

÷	72	120	600	900
2	36			
3				
6				

C. Fill in the blanks. **ANS**

1. $72 \times 10 \times 0 \times 1 =$ _____
2. $32 \times$ _____ $= 32000$
3. _____ $\div 7 = 15$
4. $100 \div 5 =$ _____
5. $16 \times 9 = 144$. So, $144 \div 9 =$ _____

D. Compare each pair of numbers. Put >, < or = in the ⬤. **ANS**

1. $3 \times 7 \times 10$ ⬤ $30 \times 7 \times 1$
2. 6×5 ⬤ $90 \div 2$
3. 44×10 ⬤ 10×10
4. $110 \div 11$ ⬤ $120 \div 12$
5. $4 \times 5 \times 0$ ⬤ 2×10
6. $64 \div 64$ ⬤ $32 \div 1$

E. Build the target number with the 3 given numbers, using a combination of operations (+, −, ×, ÷). **ANS**

1. Target number = 22
   2 4 6   _____$4 \times 6 - 2 = 22$_____
2. Target number = 15
   1 3 18   _____
3. Target number = 4
   1 3 9
4. Target number = 13
   2 4 5

Worksheet

A. Fill in the blanks. ANS

1. $11175 +$ _____ $= 20000$
2. _____ $- 12505 = 15000$
3. If $110 \times 6 = 660$, then $110 \times 12 =$ _____
4. When a number is divided by 12, the quotient is 15 and the remainder is 10. What is the number? _____
5. Double of a number is 88. What is half of the number? _____
6. Twice the product of 9 and 7 is _____
7. The product of the smallest 3-digit number and the face value of the digit 7 in the number 87015 is _____

B. Tick (✓) the correct option. (HINT: Use the DMAS rule.) ANS

1. $12 \div 3 \times 2$
   - a. 18 ☐
   - b. 2 ☐
   - c. 8 ☐
   - d. 17 ☐
2. $7 - 10 \div 2$
   - a. 1 ☐
   - b. 2 ☐
   - c. $3\frac{1}{2}$ ☐
   - d. 4 ☐
3. $6 \div 2 + 3$
   - a. 1 ☐
   - b. 4 ☐
   - c. 6 ☐
   - d. 8 ☐
4. $7 - 1 \times 2$
   - a. 5 ☐
   - b. 12 ☐
   - c. 1 ☐
   - d. none of these ☐
5. $6 + 2 \times 8 \div 2$
   - a. 11 ☐
   - b. 32 ☐
   - c. 14 ☐
   - d. 12 ☐

C. Solve these story sums. ANS

1. There are 27,100 beads in a bag. 14,070 of them are red and the rest are green. How many less green beads than red beads are there in the bag?
2. Tarun bought 50 boxes of eggs. Each box contains two dozen eggs. From those he sold 975 eggs. How many eggs were left?
3. Kanya had 64 boxes of pencils. Each box contained 18 pencils. She repacked them equally in 24 bags. How many pencils were there in each bag?
4. Every month, Mr Ali gets a salary of ₹45,800 and his mother gets a pension of