

UNIQUE STUDY POINT

CLASS VI: MATHEMATICS NCERT SOLUTIONS

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NCERT SOLUTION CHAPTER 2: WHOLE NUMBER

Mathematics NCERT Grade 6, Chapter 2: **Whole Numbers**- As the name suggests this chapter explains the **whole numbers**.

- The **natural numbers** along with **zero** form the collection of **whole numbers**.

The chapter starts with the introduction on **predecessor** and **successor** followed by concept of **whole numbers**.

- If you add 1 to a **natural number**, we get its **successor**. If you subtract 1 from a **natural number**, you get its **predecessor**.
- Every **natural number** has a **successor**.
- Every **natural number** except 1 has a **predecessor**.
- Every **whole number** has a **successor**.
- Every **whole number** except zero has a **predecessor**.
- All **natural numbers** are **whole numbers**, but all **whole numbers** are not **natural numbers**.

The topic **number line** is discussed in detail along with the operations like **addition**, **subtraction and multiplication** that can be performed on them.

This is followed by **Properties of whole numbers**. Various properties associated with whole numbers are explained in this chapter with examples.

- **Closure property**
- Division of a whole number by 0 is not defined.
- **Commutativity** of addition and multiplication
- **Associativity** of addition and multiplication
- **Distributivity of multiplication over addition**
- **Zero** is called an **identity** for addition of whole numbers or **additive identity** for whole numbers.
- **Whole number 1** is the **identity for multiplication** of whole numbers.

Patterns in whole numbers are the last topic that is discussed in this chapter- **Whole numbers**. These patterns are formed using numbers and **arrangement of dots**. This section contains 5 questions in the column titled '**Try These**'. Students must try these questions as they are not only fun to attempt but also help in building the concept. A total of 3 exercises are given in the chapter. Ample number of solved examples are given for reference to solve the unsolved questions.

Important points are mentioned at the end of the chapter in the form of a summary.

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Question 1:

Write the next three natural numbers after 10999.

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ANSWER:

Next three natural numbers after 10999 are

11000, 11001, 11002

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Question 2:

Write the three whole numbers occurring just before 10001.

ANSWER:

3 whole numbers just before 10001 are

10000, 9999, 9998

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Question 3:

Which is the smallest whole number?

ANSWER:

The smallest whole number is 0.

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Question 4:

How many whole numbers are there between 32 and 53?

ANSWER:

Whole numbers between 32 and 53 = 20 ($53 - 32 - 1 = 20$)

(33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52)

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Question 5:

Write the successor of:

(a) 2440701 (b) 100199

(c) 1099999 (d) 2345670

ANSWER:

(a) $2440701 + 1 = 2440702$

(b) $100199 + 1 = 100200$

(c) $1099999 + 1 = 1100000$

(d) $2345670 + 1 = 2345671$

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Question 6:

Write the predecessor of:

(a) 94 (b) 10000

(c) 208090 (d) 7654321

ANSWER:

(a) $94 - 1 = 93$

(b) $10000 - 1 = 9999$

(c) $208090 - 1 = 208089$

(d) $7654321 - 1 = 7654320$

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Question 7:

In each of the following pairs of numbers, state which whole number is on the left of the other number on the number line. Also write them with the appropriate sign ($>$, $<$) between them.

(a) 530, 503 (b) 370, 307

(c) 98765, 56789 (d) 9830415, 10023001

ANSWER:

(a) 530, 503

As $530 > 503$,

503 is on the left side of 530 on the number line.

(b) 370, 307

As $370 > 307$,

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307 is on the left side of 370 on the number line.

(c) 98765, 56789

As $98765 > 56789$,

56789 is on the left side of 98765 on the number line.

(d) 9830415, 10023001

Since $98,30,415 < 1,00,23,001$,

98,30,415 is on the left side of 1,00,23,001 on the number line.

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Question 8:

Which of the following statements are true (T) and which are false (F)?

- (a) Zero is the smallest natural number.
- (b) 400 is the predecessor of 399.
- (c) Zero is the smallest whole number.
- (d) 600 is the successor of 599.
- (e) All natural numbers are whole numbers.
- (f) All whole numbers are natural numbers.
- (g) The predecessor of a two digit number is never a single digit number.
- (h) 1 is the smallest whole number.
- (i) The natural number 1 has no predecessor.
- (j) The whole number 1 has no predecessor.
- (k) The whole number 13 lies between 11 and 12.
- (l) The whole number 0 has no predecessor.
- (m) The successor of a two digit number is always a two digit number.

ANSWER:

- (a) False, 0 is not a natural number.

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- (b) False, as predecessor of 399 is 398 ($399 - 1 = 398$).
- (c) True
- (d) True, as $599 + 1 = 600$
- (e) True
- (f) False, as 0 is a whole number but it is not a natural number.
- (g) False, as predecessor of 10 is 9.
- (h) False, 0 is the smallest whole number.
- (i) True, as 0 is the predecessor of 1 but it is not a natural number.
- (j) False, as 0 is the predecessor of 1 and it is a whole number.
- (k) False, 13 does not lie in between 11 and 12.
- (l) True, predecessor of 0 is -1 , which is not a whole number.
- (m) False, as successor of 99 is 100.

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Question 1:

Find the sum by suitable rearrangement:

(a) $837 + 208 + 363$ (b) $1962 + 453 + 1538 + 647$

ANSWER:

(a) $837 + 208 + 363 = (837 + 363) + 208$

$= 1200 + 208 = 1408$

(b) $1962 + 453 + 1538 + 647 = (1962 + 1538) + (453 + 647)$

$= 3500 + 1100 = 4600$

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Question 2:

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Find the product by suitable rearrangement:

(a) $2 \times 1768 \times 50$ (b) $4 \times 166 \times 25$

(c) $8 \times 291 \times 125$ (d) $625 \times 279 \times 16$

(e) $285 \times 5 \times 60$ (f) $125 \times 40 \times 8 \times 25$

ANSWER:

(a) $2 \times 1768 \times 50 = 2 \times 50 \times 1768$

$= 100 \times 1768 = 176800$

(b) $4 \times 166 \times 25 = 4 \times 25 \times 166$

$= 100 \times 166 = 16600$

(c) $8 \times 291 \times 125 = 8 \times 125 \times 291$

$= 1000 \times 291 = 291000$

(d) $625 \times 279 \times 16 = 625 \times 16 \times 279$

$= 10000 \times 279 = 2790000$

(e) $285 \times 5 \times 60 = 285 \times 300 = 85500$

(f) $125 \times 40 \times 8 \times 25 = 125 \times 8 \times 40 \times 25$

$= 1000 \times 1000 = 1000000$

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Question 3:

Find the value of the following:

(a) $297 \times 17 + 297 \times 3$ (b) $54279 \times 92 + 8 \times 54279$

(c) $81265 \times 169 - 81265 \times 69$ (d) $3845 \times 5 \times 782 + 769 \times 25 \times 218$

ANSWER:

(a) $297 \times 17 + 297 \times 3 = 297 \times (17 + 3)$

$= 297 \times 20 = 5940$

(b) $54279 \times 92 + 8 \times 54279 = 54279 \times 92 + 54279 \times 8$

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$$= 54279 \times (92 + 8)$$

$$= 54279 \times 100 = 5427900$$

$$(c) 81265 \times 169 - 81265 \times 69 = 81265 \times (169 - 69)$$

$$= 81265 \times 100 = 8126500$$

$$(d) 3845 \times 5 \times 782 + 769 \times 25 \times 218$$

$$= 3845 \times 5 \times 782 + 769 \times 5 \times 5 \times 218$$

$$= 3845 \times 5 \times 782 + 3845 \times 5 \times 218$$

$$= 3845 \times 5 \times (782 + 218)$$

$$= 19225 \times 1000 = 19225000$$

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Question 4:

Find the product using suitable properties.

$$(a) 738 \times 103 \quad (b) 854 \times 102$$

$$(c) 258 \times 1008 \quad (d) 1005 \times 168$$

ANSWER:

$$(a) 738 \times 103 = 738 \times (100 + 3)$$

$$= 738 \times 100 + 738 \times 3 \text{ (Distributive property)}$$

$$= 73800 + 2214$$

$$= 76014$$

$$(b) 854 \times 102 = 854 \times (100 + 2)$$

$$= 854 \times 100 + 854 \times 2 \text{ (Distributive property)}$$

$$= 85400 + 1708 = 87108$$

$$(c) 258 \times 1008 = 258 \times (1000 + 8)$$

$$= 258 \times 1000 + 258 \times 8 \text{ (Distributive property)}$$

$$= 258000 + 2064 = 260064$$

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$$\begin{aligned} \text{(d) } 1005 \times 168 &= (1000 + 5) \times 168 \\ &= 1000 \times 168 + 5 \times 168 \text{ (Distributive property)} \\ &= 168000 + 840 = 168840 \end{aligned}$$

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Question 5:

A taxi driver filled his car petrol tank with 40 litres of petrol on Monday. The next day, he filled the tank with 50 litres of petrol. If the petrol costs Rs 44 per litre, how much did he spend in all on petrol?

ANSWER:

Quantity of petrol filled on Monday = 40 l

Quantity of petrol filled on Tuesday = 50 l

Total quantity filled = (40 + 50) l

Cost of petrol (per l) = Rs 44

Total money spent = $44 \times (40 + 50)$

$= 44 \times 90 = \text{Rs } 3960$

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Question 6:

A vendor supplies 32 litres of milk to a hotel in the morning and 68 litres of milk in the evening. If the milk costs Rs 15 per litre, how much money is due to the vendor per day?

ANSWER:

Quantity of milk supplied in the morning = 32 l

Quantity of milk supplied in the evening = 68 l

Total of milk per litre = (32 + 68) l

Cost of milk per litre = Rs 15

Total cost per day = $15 \times (32 + 68)$

$= 15 \times 100 = \text{Rs } 1500$

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Question 7:

Match the following:

(i) $425 \times 136 = 425 \times (6 + 30 + 100)$

(a) Commutativity under multiplication

(ii) $2 \times 49 \times 50 = 2 \times 50 \times 49$

(b) Commutativity under addition

(iii) $80 + 2005 + 20 = 80 + 20 + 2005$

(c) Distributivity of multiplication over addition

ANSWER:

(i) $425 \times 136 = 425 \times (6 + 30 + 100)$ [Distributivity of multiplication over addition]

Hence, (c)

(ii) $2 \times 49 \times 50 = 2 \times 50 \times 49$ [Commutativity under multiplication]

Hence, (a)

(iii) $80 + 2005 + 20 = 80 + 20 + 2005$ [Commutativity under addition]

Hence, (b)

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Question 1:

Which of the following will not represent zero?

(a) $1 + 0$ (b) 0×0

(c) $\frac{0}{2}$ (d) $\frac{10-10}{2}$

ANSWER:

(a) $1 + 0 = 1$

It does not represent zero.

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(b) $0 \times 0 = 0$

It represents zero.

(c) $\frac{0}{2} = 0$

It represents zero.

(d) $\frac{10-10}{2} = 0$

It represents zero.

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Question 2:

If the product of two whole numbers is zero, can we say that one or both of them will be zero? Justify through examples.

ANSWER:

If the product of 2 whole numbers is zero, then one of them is definitely zero.

For example, $0 \times 2 = 0$ and $17 \times 0 = 0$

If the product of 2 whole numbers is zero, then both of them may be zero.

$$0 \times 0 = 0$$

However, $2 \times 3 = 6$

(Since numbers to be multiplied are not equal to zero, the result of the product will also be non-zero.)

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Question 3:

If the product of two whole numbers is 1, can we say that one of both of them will be 1? Justify through examples.

ANSWER:

If the product of 2 numbers is 1, then both the numbers have to be equal to 1.

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For example, $1 \times 1 = 1$

However, $1 \times 6 = 6$

Clearly, the product of two whole numbers will be 1 in the situation when both numbers to be multiplied are 1.

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Question 4:

Find using distributive property:

(a) 728×101 (b) 5437×1001

(c) 824×25 (d) 4275×125

(e) 504×35

ANSWER:

(a) $728 \times 101 = 728 \times (100 + 1)$

$$= 728 \times 100 + 728 \times 1$$

$$= 72800 + 728 = 73528$$

(b) $5437 \times 1001 = 5437 \times (1000 + 1)$

$$= 5437 \times 1000 + 5437 \times 1$$

$$= 5437000 + 5437 = 5442437$$

(c) $824 \times 25 = (800 + 24) \times 25$

$$= (800 + 25 - 1) \times 25$$

$$= 800 \times 25 + 25 \times 25 - 1 \times 25$$

$$= 20000 + 625 - 25$$

$$= 20000 + 600 = 20600$$

(d) $4275 \times 125 = (4000 + 200 + 100 - 25) \times 125$

$$= 4000 \times 125 + 200 \times 125 + 100 \times 125 - 25 \times 125$$

$$= 500000 + 25000 + 12500 - 3125$$

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$$= 534375$$

$$(e) 504 \times 35 = (500 + 4) \times 35$$

$$= 500 \times 35 + 4 \times 35$$

$$= 17500 + 140 = 17640$$

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Question 5:

Study the pattern:

$$1 \times 8 + 1 = 9 \quad 1234 \times 8 + 4 = 9876$$

$$12 \times 8 + 2 = 98 \quad 12345 \times 8 + 5 = 98765$$

$$123 \times 8 + 3 = 987$$

Write the next two steps. Can you say how the pattern works?

(Hint: $12345 = 11111 + 1111 + 111 + 11 + 1$).

ANSWER:

$$123456 \times 8 + 6 = 987648 + 6 = 987654$$

$$1234567 \times 8 + 7 = 9876536 + 7 = 9876543$$

Yes, the pattern works.

$$\text{As } 123456 = 111111 + 11111 + 1111 + 111 + 11 + 1,$$

$$123456 \times 8 = (111111 + 11111 + 1111 + 111 + 11 + 1) \times 8$$

$$= 111111 \times 8 + 11111 \times 8 + 1111 \times 8 + 111 \times 8 + 11 \times 8 + 1 \times 8$$

$$= 888888 + 88888 + 8888 + 888 + 88 + 8 = 987648$$

$$123456 \times 8 + 6 = 987648 + 6 = 987654$$