CHAPTER – 2
WHOLE NUMBERS
EXERCISE – 2.1

Q.1 Write the next three natural numbers after 10999.

Answer:

Next three natural numbers after 10999 are;
10999 + 1, 10999 + 2, 10999 + 3

= 11000, 11001 and 11002.

Q.2 Write the three whole numbers occurring just before 10001.

Answer:

Three whole numbers occurring just before 10001 are;

10000, 9999 and 9998.

Q.3 Which is the smallest whole number?

Answer:

The smallest whole number is 0.

Q.4 How many whole numbers are there between 32 and 53?

Answer:

We know whole numbers are all counting numbers along with number 0.
So, Whole numbers between 53 and 32 = (53 – 32 - 1) = 20

These are: 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51 and 52.

Q.5 Write successor of:

(a) 2440701   (b) 100199

(c) 1099999   (d) 2345670

Answer:

The successor of a number is the number obtained by adding one to it, also known as the after number.

For example – successor of 9 will be 9+1 = 10

    a. 2440701+1 = 2440702

    b. 100199+1 = 100200

    c. 1099999+1 = 1100000

    d. 2345670+1 = 2345671

Q.6 Write the predecessor of:

(a) 94   (b) 10000

(c) 208090 (d) 7654321

Answer:

The predeccessor of a number is the number obtained by substracting one from the given number, also known as the before number.

For example – predecessor of 9 will be 8 (9 - 1 = 8)

    a. 94 – 1 = 93

    b. 10000 – 1 = 9999

    c. 208090 – 1 = 208089

    d. 7654321 – 1 = 7654320

Q,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 (> or <) between them.

(a) 530, 503
(b) 370, 307
(c) 98765, 56789
(d) 9830415, 10023001

Answer:

a. 530 > 503

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

b. 370 > 307

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

c. 98765 > 56789

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

d. 9830415 < 10023001

9830415 is on the left side of the 10023001 on the number line.

Q.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.

The natural numbers are also called as counting numbers which start from 1, 2, 3, 4, 5 and so on.…

b. False.

Because 400 is the successor of 399.

The predecessor of 399 will be 398 (399-1).

c. True.

As whole numbers start from 0,1,2,3,4 and so on.

Yes, 0 is the smallest whole number.

d. True.

600 is the successor of 599 (599 + 1 = 600).

e. True.

As we know whole numbers starts from 0, 1, 2, 3, 4, 5… and natural numbers starts from 1, 2, 3, 4, 5.

So, all natural numbers are whole numbers.

f. False

As we know, whole numbers start from 0 and natural numbers starts from 1.

0 is a whole number but not a natural number.

g. False.

The predecessor of a two-digit number can also be a single digit number.

For example – The predecessor of 10 is 9 which is a single digit number.

h. False.

As we know whole numbers starts from 0, so, 0 is the smallest whole number.

i. True.

As 0 is the predecessor of 1 but it's not the natural number.

j. False.

0 is the predecessor of 1 and it is a whole number.

k. False.

The whole number 13 doesn't lies between 11 and 12. It's the successor of 12.

l. True.

The whole number 0 has -1 as its predecessor but it is not a whole number.

m. False.

It is not necessary that, the successor of a two-digit number is always a two-digit number as 100 is the successor of 99 which is not a two-digit number.

EXERCISE – 2.2

Q.1 Find the sum by suitable rearrangement:
(a) $837 + 208 + 363$
(b) $1962 + 453 + 1538 + 647$

Answer:

a. Arrange the numbers in the decreasing order;
$837 + 363 + 208$
Now make pairs,
$= (837+363) + 208$
$= 1200+208$
$= 1408$

b. Arrange the numbers in decreasing order,
$= 1962 + 1538 + 647 + 453$
Now make pairs,
$= (1962 + 1538) + (647 + 453)$
$= 3500 + 1100$
$= 4600$

Q.2 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. $2 \times 1768 \times 50$
Arrange it in increasing order,
$= 2 \times 50 \times 1768$
$= 100 \times 1768$
$= 176800$

b. $4 \times 166 \times 25$

Arrange it in increasing form,

$= 4 \times 25 \times 166$

$= 100 \times 166$

$= 16600$

c. $8 \times 291 \times 125$

$= 8 \times 125 \times 291$

$= 1000 \times 291$

$= 291000$

d. $625 \times 279 \times 16$

$= 625 \times 16 \times 279$

$= 10000 \times 279$

$= 279000$

e. $285 \times 5 \times 60$

$= 285 \times 300$

$= 85500$

f. $125 \times 40 \times 8 \times 25$

$= 125 \times 8 \times 40 \times 25$

$= 1000 \times 1000$

$= 1000000$

Q.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. $297 \times 17 + 297 \times 3$

As we can clearly see it is in the form of;

$= ab + ac$

= a (b + c)
So,
= 297 × (17+3)
= 297 + 20
= 5940

b. 54279 × 92 + 8 × 54279
= 54279 × (92+8)
= 54279 × 100
= 5427900

c. 81265 × 169 – 81265 × 69
= 81265 × (169-69)
= 81265×100
= 8126500

d. 3845 × 5 × 782 + 769 × 25 × 218
= 3845 × 5 × 782 + 769 × 5 × 5 × 218
= 3845 × 5 × 782 + 3845 × 5 × 218
= 3845 × 5 × (782 + 218)
= 19225×1000
= 19225000

Q.4 Find the product using suitable properties.

(a) 738 × 103 (b) 854 × 102

(c) 258 × 1008 (d) 1005 × 168

Answer:

a. 738 × 103
By using distributive property;
We get,
= 738(100 + 3)
= 738 × 100 + 738 × 3
= 73800+2214

$= 76014$

b. 854×102

By using distributive property, we get,

$= 854 \times (100+2)$

$= 854 \times 100 + 854 \times 2$

$= 85400 + 1708$

$= 87108$

c. 258×1008

By using distributive property, we get,

$= 258 \times (1000 + 8)$

$= 258 \times 1000 + 258 \times 8$

$= 258000 + 2064$

$= 260064$

d. 1005×168

By using distributive property, we get,

$= (1000 + 5) \times 168$

$= 1000 \times 168 + 5 \times 168$

$= 168000 + 84$

$= 168840$

Q.5 Write successor of:

(a) 2440701   (b) 100199
(c) 1099999   (d) 2345670

Answer:

The successor of a number is the number obtained by adding one to it, also known as the after number.
For example – successor of 9 will be 9+1 = 10

a. $2440701+1 = 2440702$

b. $100199+1 = 100200$

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Q. 6 Write the predecessor of:

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Answer:

The predeccessor of a number is the number obtained by substracting one from the given number, also known as the before number.

For example – predecessor of 9 will be 8 (9-1 = 8)

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 b. $10000 - 1 = 9999$

 c. $208090 - 1 = 208089$

 d. $7654321 - 1 = 7654320$

Q. 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 (> or <) between them.

(a) 530, 503

(b) 370, 307

(c) 98765, 56789

(d) 9830415, 10023001

Answer:

 a. $530 > 503$

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

 b. $370 > 307$

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

c. $98765 > 56789$

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

d. $9830415 < 10023001$

9830415 is on the left side of the 10023001 on the number line.

Q. 8 Which of the following statements are true (T) and which are false (F)?

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(h) 1 is the smallest whole number.

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(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.

        The natural numbers are also called as counting numbers which start from 1, 2, 3, 4, 5 and so on….

    b. False.

        Because 400 is the successor of 399.

        The predecessor of 399 will be 398 (399-1).

    c. True.

        As whole numbers start from 0,1,2,3,4 and so on.

        Yes, 0 is the smallest whole number.

d. True.

600 is the successor of 599 (599 + 1 = 600).

e. True.

As we know whole numbers starts from 0, 1, 2, 3, 4, 5… and natural numbers starts from 1, 2, 3, 4, 5.

So, all natural numbers are whole numbers.

f. False.

As we know, whole numbers start from 0 and natural numbers starts from 1.

0 is a whole number but not a natural number.

g. False.

The predecessor of a two-digit number can also be a single digit number.

For example – The predecessor of 10 is 9 which is a single digit number.

h. False.

As we know whole numbers starts from 0, so, 0 is the smallest whole number.

i. True.

As 0 is the predecessor of 1 but it's not the natural number.

j. False.

0 is the predecessor of 1 and it is a whole number.

k. False.

The whole number 13 doesn't lies between 11 and 12. It's the successor of 12.

l. True.

The whole number 0 has -1 as its predecessor but it is not a whole number.

m. False.

It is not necessary that, the successor of a two-digit number is always a two-digit number as 100 is the successor of 99 which is not a two-digit number.

EXERCISE – 2.2

Q. 1 Find the sum by suitable rearrangement:
(a) $837 + 208 + 363$
(b) $1962 + 453 + 1538 + 647$

Answer:

   a. Arrange the numbers in the decreasing order;
      $837 + 363 + 208$
      Now make pairs,
      $= (837 + 363) + 208$
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   b. Arrange the numbers in decreasing order,
      $= 1962 + 1538 + 647 + 453$
      Now make pairs,
      $= (1962 + 1538) + (647 + 453)$
      $= 3500 + 1100$
      $= 4600$

Q. 2 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. $2 \times 1768 \times 50$
      Arrange it in increasing order,
      $= 2 \times 50 \times 1768$
      $= 100 \times 1768$
      $= 176800$

   b. $4 \times 166 \times 25$

Arrange it in increasing form,

= 4 × 25 × 166

= 100 ×166

= 16600

c. 8 × 291 × 125

= 8 × 125 × 291

= 1000 × 291

= 291000

d. 625 × 279 × 16

= 625 × 16 × 279

= 10000 × 279

= 279000

e. 285 × 5 × 60

= 285 × 300

= 85500

f. 125 × 40 × 8 × 25

= 125 × 8 × 40 × 25

= 1000×1000

= 1000000

Q. 3 Find the value of the following:

(a) 297 × 17 + 297 × 3
(b) 54279 × 92 + 8 × 54279
(c) 81265 × 169 – 81265 × 69
(d) 3845 × 5 × 782 + 769 × 25 × 218

Answer:

a. 297 × 17 + 297 × 3

As we can clearly see it is in the form of;

= ab + ac

= a (b + c)

So,
$= 297 \times (17 + 3)$
$= 297 + 20$
$= 5940$

b. $54279 \times 92 + 8 \times 54279$
$= 54279 \times (92 + 8)$
$= 54279 \times 100$
$= 5427900$

c. $81265 \times 169 - 81265 \times 69$
$= 81265 \times (169\text{-}69)$
$= 81265 \times 100$
$= 8126500$

d. $3845 \times 5 \times 782 + 769 \times 25 \times 218$
$= 3845 \times 5 \times 782 + 769 \times 5 \times 5 \times 218$
$= 3845 \times 5 \times 782 + 3845 \times 5 \times 218$
$= 3845 \times 5 \times (782 + 218)$
$= 19225 \times 1000$
$= 19225000$

Q. 4 Find the product using suitable properties.
(a) 738×103 (b) 854×102
(c) 258×1008 (d) 1005×168

Answer:

a. 738×103
By using distributive property;
We get,
$= 738(100 + 3)$
$= 738 \times 100 + 738 \times 3$
$= 73800 + 2214$
$= 76014$

b. 854×102
By using distributive property, we get,

$= 854 \times (100 + 2)$

$= 854 \times 100 + 854 \times 2$

$= 85400 + 1708$

$= 87108$

  c. 258×1008

  By using distributive property, we get,

  $= 258 \times (1000 + 8)$

  $= 258 \times 1000 + 258 \times 8$

  $= 258000 + 2064$

  $= 260064$

  d. 1005×168

  By using distributive property, we get,

  $= (1000 + 5) \times 168$

  $= 1000 \times 168 + 5 \times 168$

  $= 168000 + 840 = 168840$

Q. 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:

Petrol filled on Monday = 40 litres

Petrol filled on Tuesday = 50 litres

Total petrol filled = (40+50) litres

Cost of petrol = 44 Rs per litre

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

$= 44 \times 40 + 44 \times 50$

$= 1760 + 2200$

= 3960 Rs.

Q. 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. 45 per litre, how much money is due to the vendor per day?

Answer:

Milk supplied in the morning = 32 L

Milk supplied in the evening = 68 L

Total milk supplied every day = (32 + 68) L

Cost of milk = 45 Rs

Total cost per day = 45 × (32+68)

= 45 × 100

= 4500 Rs

Thus, Rs 4500 is due to the vendor every day

Q. 7 Match the following:

(i) 425 × 136 = 425 × (6+ 30 +100)	(a) Commutativity of multiplication
(ii) 2 × 49 × 50 = 2 × 50 × 49	(b) Commutativity of addition
(iii) 80 + 2005 + 20 = 80 + 20 + 2005	(c) Distributivity of multiplication over addition

Answer:

(i) 425 × 136 = 425 × (6+ 30 +100)	(a) Distributivity of multiplication over addition	Explanation: 136 can be written as 6 + 30 + 100
(ii) 2 × 49 × 50 = 2 × 50 × 49	(b) Commutativity of multiplication	Explanation: It means that the operands can be written regardless of the order
(iii) 80 + 2005 + 20 = 80 + 20 +2005	(c) Commutativity of addition	Explanation: It means that the operands can be written regardless of the order

EXERCISE 2.3

Q. 1 Which of the following will not represents zero:

(a) $1 + 0$ (b) 0×0

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

Answer:

    a. $1 + 0 = 1$

       It does not represent 0.

    b. $0 \times 0 = 0$

       It does represent 0.

    c. $\dfrac{0}{2} = 0$

       It does represent 0.

    d. $\dfrac{10-10}{2} = 0$

       It does represent 0.

Q. 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:

Yes, if the product of two whole numbers is zero, then one of them will be 0.

For example-

$1 \times 0 = 0$

$0 \times 7 = 0$

Yes, if the product of two whole numbers is zero, then both may also be 0.

For example-

$0 \times 0 = 0$

Q. 3 If the product of two whole numbers is 1, can we say that one or both of them will be 1? Justify through examples.

Answer:

If the product of two numbers is 1, then both the numbers need to be 1.

Example -

$1 \times 1 = 1$

However, if only one number is 1 then,

Example –

$1 \times 9 = 9$

So,

We can say that the product of two whole numbers is 1 only when, both 1.

Q. 4 Find using distributive property:

(a) 728×101 (b) 5437×1001
(c) 824×25 (d) 4275×125
(e) 504×35.

Answer:

Distributive property is,

$a (b + c) = ab + ac$

   a. 728×101
      $= 728 \times (100 + 1)$
      $= 728 \times 100 + 728 \times 1$
      $= 72800 + 728 = 73528$

b. 5437×1001

$\qquad = 5437 \times (1000 + 1)$

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

$\qquad = 5437000 + 5437$

$\qquad = 5442437$

c. 824×25

$\qquad = (800 + 24) \times 25$

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

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

$\qquad = 20000 + 625 - 25$

$\qquad = 20000 + 600$

$\qquad = 20600$

d. 4275×125

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

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

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

$\qquad = 534375$

e. 504×35

$\qquad = (500 + 4) \times 35$

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

$\qquad = 17500 + 140$

$\qquad = 17640$

Q. 5 Study the pattern:

$1 \times 8 + 1 = 9$

$12 \times 8 + 2 = 98$

$123 \times 8 + 3 = 987$

$1234 \times 8 + 4 = 9876$

$12345 \times 8 + 5 = 98765$

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

Answer:

From the given pattern, the 1st step is: $1 \times 8 + 1 = 9$

And the **2ⁿᵈ step: $12 \times 8 + 2 = 98$**, which can be written as:

$(11 + 1) \times 8 + 2$

On following distributive property, we get,

$= (11 \times 8) + (1 \times 8) + 2$

$= 88 + 8 + 2 = 98$

Therefore, we can write the **3ʳᵈ step: $123 \times 8 + 3 = 987$** as,

$= (111 + 11 + 1) \times 8 + 3$

$= 111 \times 8 + 11 \times 8 + 1 \times 8 + 2$

$= 888 + 88 + 8 + 3 = 987$

Similarly, **4ᵗʰ step: $1234 \times 8 + 4 = 9876$** as,

$= (1111 + 111 + 11 + 1) \times 8 + 4$

$= 1111 \times 8 + 111 \times 8 + 11 \times 8 + 1 \times 8 + 4$

$= 8888 + 888 + 88 + 8 + 4 = 9876$

In the same way, the next steps are:

5ᵗʰ step: $12345 \times 8 + 5$, can be written as,

$= (111111 + 11111 + 1111 + 111 + 11 + 1) \times 8 + 5$
$= 111111 \times 8 + 11111 \times 8 + 1111 \times 8 + 111 \times 8 + 11 \times 8 + 1 \times 8 + 5 =$
$888888 + 88888 + 8888 + 888 + 88 + 8 + 6 = 98765$

Thus, **the 5ᵗʰ term is : $12345 \times 8 + 5 = 98765$**

Now, the 6ᵗʰ step: $123456 \times 8 + 6$ can be written as,

$= (1111111 + 111111 + 11111 + 1111 + 111 + 11 + 1) \times 8 + 7$

$= 1111111 \times 8 + 111111 \times 8 + 11111 \times 8 + 1111 \times 8 + 111 \times 8 + 11 \times 8 + 1 \times 8 + 7$

$= 8888888 + 888888 + 88888 + 8888 + 888 + 88 + 8 + 7$

$= 9876543$

Thus, the 6th step is: $123456 \times 8 + 6 = 9876543$