

2 Whole Numbers

Learn and Remember

- Successor.** The successor of a whole number is the number obtained by adding 1 to it.
- Predecessor.** The predecessor of a whole number is one less than given number.
- '1' is the smallest natural number.
- '0' is the smallest whole number.
- Every whole number on the number line is greater than every whole number on its left.
- Every whole number on the number line is less than every whole number on its right.
- Commutative property of addition : $a + b = b + a$.
- Commutative property of multiplication : $a \times b = b \times a$.
- Associative property of addition : $a + (b + c) = (a + b) + c$.
- Associative property of multiplication : $(a \times b) \times c = a \times (b \times c)$.
- Distributive property over addition : $a \times (b + c) = (a \times b) + (a \times c)$.
- Distributive property over subtraction : $a \times (b - c) = (a \times b) - (a \times c)$.

TEXTBOOK QUESTIONS SOLVED

EXERCISE 2.1

Q1. Write the next three natural numbers after 10999.

Sol. $10,999 + 1 = 11000$

$$11000 + 1 = 11001$$

$$11001 + 1 = 11002.$$

Q2. Write the three whole numbers occurring just before 10001.

Sol. $10,001 - 1 = 10000$

$$10000 - 1 = 9999$$

$$9999 - 1 = 9998.$$

Q3. Which is the smallest whole number?

Sol. '0' (zero) is the smallest whole number.

Q4. How many whole numbers are there between 32 and 53?

Sol. There are '20' whole numbers between these two numbers
(33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52)

Q5. Write the successor of:

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

Sol. (a) $2440701 + 1 = 2440702$ (b) $100199 + 1 = 100200$

(c) $1099999 + 1 = 1100000$ (d) $2345670 + 1 = 2345671.$

Q6. Write the predecessor of:

(a) 94 (b) 10000 (c) 208090 (d) 7654321

Sol. (a) $94 - 1 = 93$ (b) $10000 - 1 = 9999$

(c) $208090 - 1 = 208089$ (d) $7654321 - 1 = 7654320.$

Q7. 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

Sol. (a) $530 > 503$: 503 appear on left of 530.

(b) $370 > 307$: 307 appear on the left of 370.

(c) $98765 > 56789$: 56789 appear on left of 98765.

(d) $9830415 < 10023001$: 9830415 appear on left of 10023001.

Q8. 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.

- Sol. (a) False (b) False (c) True (d) True
 (e) True (f) False (g) False (h) False
 (i) True (j) False (k) False (l) True
 (m) False.

EXERCISE 2.2

Q1. Find the sum by suitable rearrangement:

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

Sol. (a) $837 + 208 + 363$ (b) $1962 + 453 + 1538 + 647$
 $= (837 + 363) + 208$ $= (1962 + 1538) + (453 + 647)$
 $= 1200 + 208$ $= (3500) + (1100)$
 $= 1408.$ $= 4600.$

Q2. 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) $125 \times 40 \times 8 \times 25$

Sol. (a) $2 \times 1768 \times 50$ (b) $4 \times 166 \times 25$
 $= (2 \times 50) \times 1768$ $= (4 \times 25) \times 166$
 $= 100 \times 1768$ $= 100 \times 166$
 $= 176800.$ $= 16600.$
 (c) $8 \times 291 \times 125$ (d) $625 \times 279 \times 16$
 $= (8 \times 125) \times 291$ $= (25 \times 25) \times (279) \times (4 \times 4)$
 $= 1000 \times 291$ $= (25 \times 4) \times (25 \times 4) \times 279$
 $= 291000.$ $= 100 \times 100 \times 279.$
 $= 2790000.$
 (e) $285 \times 5 \times 60$ (f) $125 \times 40 \times 8 \times 25$
 $= 285 \times (5 \times 60)$ $= (125 \times 8) \times (40 \times 25)$
 $= 285 \times 300$ $= 1000 \times 1000$
 $= 85500.$ $= 10,00,000.$

Q3. 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) $3845 \times 5 \times 782 + 769 \times 25 \times 218$

Sol. (a) $297 \times 17 + 297 \times 3$ (b) $54279 \times 92 + 8 \times 54279$
 $= 297 \times (17 + 3)$ $= 54279 \times (92 + 8)$
 $= 297 \times 20$ $= 54279 \times 100$
 $= 5940.$ $= 5427900.$
 (c) $81265 \times 169 - 81265 \times 69$ (d) $3845 \times 5 \times 782 + 769 \times 25 \times 218$
 $= 81265 \times (169 - 69)$ $= 3845 \times 5 \times 782 + 769 \times 5 \times 5 \times 218$
 $= 81265 \times 100$ $= 3845 \times 5 \times 782 + 3845 \times 5 \times 218$
 $= 8126500.$ $= 3845 \times 5 \times (782 + 218)$
 $= 19225 \times 1000$
 $= 19225000.$

Q4. Find the product, using suitable properties:

(a) 738×103 (b) 854×102
 (c) 258×1008 (d) 1005×168

Sol. (a) 738×103 (b) 854×102
 $= 738 \times (100 + 3)$ $= 854 \times (100 + 2)$
 $= (738 \times 100) + (738 \times 3)$ $= 854 \times 100 + 854 \times 2$
 $= 73800 + 2214$ $= 85400 + 1708$
 $= 76014.$ $= 87108.$
 (c) 258×1008 (d) 1005×168
 $= 258 \times (1000 + 8)$ $= (1000 + 5) \times 168$
 $= 258 \times 1000 + 258 \times 8$ $= 1000 \times 168 + 5 \times 168$
 $= 258000 + 2064$ $= 168000 + 840$
 $= 260064.$ $= 168840.$

Q5. 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 ₹ 44 per litre, how much did he spend in all on petrol?

Sol. Petrol filled on Monday = 40 litres
 Petrol filled next day = 50 litres
 Total petrol filled = (40 + 50) litres
 Cost per unit = ₹ 44
 Total cost = $44 \times (40 + 50) = 44 \times 90$
 $= 44 \times (100 - 10)$
 $= 4400 - 440 = ₹ 3960.$

Total cost of petrol ₹ 3960.

Q6. 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 ₹ 15 per litre, how much money is due to the vendor per day?

Sol. Supply of milk in morning = 32 litres
 Supply of milk in evening = 68 litres

$$\text{Total supply} = 32 + 68 = 100 \text{ litres}$$

$$\text{Cost per unit} = ₹ 15 \text{ per litres}$$

$$\text{Total cost of milk} = ₹ 15 \times 100 = ₹ 1500$$

$$\text{Total money due to vendor is ₹ 1500.}$$

Q.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
- Sol.** (i) $425 \times 136 = 425 \times (6 + 30 + 100)$ (c) Distributivity of multiplication over addition
- (ii) $2 \times 49 \times 50 = 2 \times 50 \times 49$ (a) Commutativity under multiplication
- (iii) $80 + 2005 + 20 = 80 + 20 + 2005$ (b) Commutativity under addition

EXERCISE 2.3

Q1. Which of the following will not represent zero:

(a) $1 + 0$ (b) 0×0 (c) $\frac{0}{2}$ (d) $\frac{10 - 10}{2}$

Sol. (a) [$1 + 0$ is equal to 1]

Q2. If the product of two whole numbers is zero can we say that one or both of them will be zero? Justify through examples.

Sol. Yes, if we multiply any number with zero the resultant product will be zero.

$$\text{Example: } 2 \times 0 = 0, 3 \times 0 = 0, 1 \times 0 = 0$$

If both number are zero, then the result also be zero.

$$0 \times 0 = 0.$$

Q3. If the product of two whole numbers is 1, can we say that one or both of them will be 1? Justify through examples.

Sol. If only one number be 1 then the product cannot be 1.

$$\text{Example: } 5 \times 1 = 5, 3 \times 1 = 3, 0 \times 1 = 0.$$

If both numbers are one then the product is 1. $1 \times 1 = 1.$

Q.4. Find using distributivity property:

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

Sol. (a) 728×101

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

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

$$= 72800 + 728$$

$$= 73528.$$

(c) 824×25

$$= 206 \times (4 \times 25)$$

$$= 206 \times 100$$

$$= 20600.$$

(e) 504×35

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

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

$$= 17500 + 140$$

$$= 17640.$$

(b) 5437×1001

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

$$= 5437 \times 1000 + 5437$$

$$= 5437000 + 5437$$

$$= 5442437.$$

(d) 4275×125

$$= 4275 \times (100 + 20 + 5)$$

$$= 4275 \times 100 + 4275 \times 20 + 4275 \times 5$$

$$= 427500 + 85500 + 21375$$

$$= 534375.$$

Q5. 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?

Sol. $123456 \times 8 + 6 = 987654$

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

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