

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) $1 + 0 = 1 \neq 0$, does not represent zero.

(b) $0 \times 0 = 0$, represents zero

(c) $\frac{0}{2} = 0$, represents zero.

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

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, Examples:

$$5 \times 0 = 0$$

$$0 \times 8 = 0$$

$$0 \times 0 = 0$$

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

Sol. This is only true, when each of the number are 1.

$$1 \times 1 = 1$$

Q4. Find using distributive property:

(a) 728×101

(b) 5437×1001

(c) 824×25

$$(d) 4275 \times 125$$

$$(e) 504 \times 35$$

Sol. (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) $824 \times 25 = 824 \times (20 + 5)$

$$= 824 \times 20 + 824 \times 5$$

$$= 16480 + 4120$$

$$= 20600$$

(d) $4275 \times 125 = 4275 \times (100 + 20 + 5)$

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

$$= 427500 + 85500 + 21375$$

$$= 534375$$

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

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

$$= 17500 + 140$$

$$= 17640$$

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. Step I: $123456 \times 8 + 6 = 987654$

Step II: $1234567 \times 8 + 7 = 9876543$

Working pattern:

$(1) \times 8 + 1 = 9$

$(12) \times 8 + 2 = (11 + 1) \times 8 + 2 = 98$

$(123) \times 8 + 3 = (111 + 11 + 1) \times 8 + 3 = 987$

$(1234) \times 8 + 4 = (1111 + 111 + 11 + 1) \times 8 + 4 = 9876$

$(12345) \times 8 + 5 = (11111 + 1111 + 111 + 11 + 1) \times 8 + 5 = 98765$

Q.6. Write the smallest whole number.

Sol. 0 is the smallest whole number.

Q.7. What is the predecessor of whole number 0?

Sol. Whole number 0 has no predecessor.

Q.8. Which property do the following statements hold?

(a) $6 + 4 = 4 + 6$

(b) $3 + 2 = \text{whole number}$

Sol. (a) $6 + 4 = 4 + 6$ holds commutative property of addition

(b) $3 + 2 = \text{whole number}$ holds closure property.

Q.9. Add the following in three ways. Indicate the property used.

(a) $25 + 36 + 15$

(b) $30 + 18 + 22$

Sol. (a) $25 + 36 + 15$

Way I: $25 + (36 + 15) = 25 + 51 = 76$

Way II: $(25 + 36) + 15 = 61 + 15 = 76$

Way III: $(25 + 15) + 36 = 40 + 36 = 76$

Here, we have used associative property.

(b) $30 + 18 + 22$

Way I: $30 + (18 + 22) = 30 + 40 = 70$

Way II: $(30 + 18) + 22 = 48 + 22 = 70$

Way III: $(30 + 22) + 18 = 52 + 18 = 70$

Here, we have used associative property.

Q10. Using distributive property, solve the following:

(a) 360×102

(b) 35×98

Sol. (a) $36 \times 102 = 36 \times (100 + 2)$

$$= 36 \times 100 + 36 \times 2$$

$$= 3600 + 72 = 3672$$

(b) $35 \times 98 = 35 \times (100 - 2) = 35 \times 100 - 35 \times 2$

$$= 3500 - 70 = 3430$$

Q11. Find the product of the greatest 3-digit number and the smallest 2-digit number.

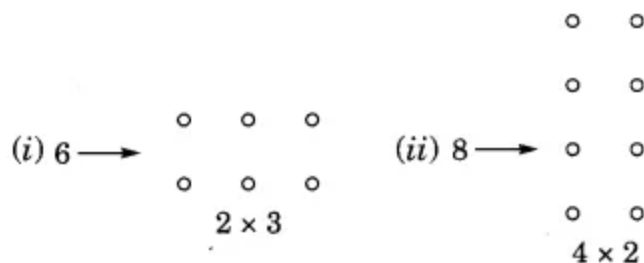
Sol. The greatest 3-digit number = 999

The smallest 2-digit number = 10

$$\therefore \text{Product} = 999 \times 10 = 9990$$

Q12. Write any two numbers which can be shown as rectangles.

Sol.



Q13. Write the predecessor of the smallest 4-digit number.

Sol. The smallest 4-digit number = 1000

$$\therefore \text{The predecessor of } 1000 = 1000 - 1 = 999$$

Q14. For $n = 5$, verify the given statement $10 \times n + 1 = n1$

Sol. Given statement is

$$10 \times n + 1 = n1$$

Put $n = 5$, $10 \times 5 + 1 = 51$

$\Rightarrow 50 + 1 = 51$

$\Rightarrow 51 = 51$. Hence, verified.

Q15. Write the next two steps:

$$1 \times 9 + 2 = 11$$

$$12 \times 9 + 3 = 111$$

Sol. Next two steps are $123 \times 9 + 4 = 1111$ and $1234 \times 9 + 5 = 11111$.

Q16. Using the properties, find the values of each of the following:

(a) 736×102

(b) $8165 \times 169 - 8165 \times 69$

Sol. (a) $736 \times 102 = 736 \times (100 + 2)$

$$= 736 \times 100 + 736 \times 2 \text{ [Using distributive property]}$$

$$= 73600 + 1472 = 75072$$

(b) $8165 \times 169 - 8165 \times 69 = 8165 \times (169 - 69)$ [Using distributive property]

$$= 8165 \times 100 = 816500$$

Q17. Observe the following patterns and extend them by two more terms.

$$11 \times 11 = 121$$

$$101 \times 101 = 10201$$

$$10101 \times 10101 = 102030201$$

Sol. Next two terms are

$$1010101 \times 1010101 = 1020304030201$$

$$101010101 \times 101010101 = 10203040504030201$$

Q18. Observe the following patterns and extend them by two more terms:

$$15873 \times 7 \times 1 = 111111$$

$$15873 \times 7 \times 2 = 222222$$

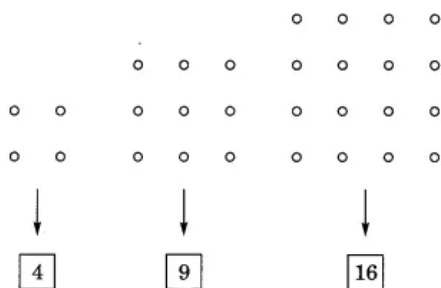
sol. Next two terms are

$$15873 \times 7 \times 3 = 333333$$

$$15873 \times 7 \times 4 = 444444$$

Q19. Write the three whole numbers which can be arranged as squares.

Sol. The required number are 4, 9, 16.



Q20. Using the properties of whole numbers, find the value of the following in suitable way:

(a) $945 \times 4 \times 25$

(b) $40 \times 328 \times 25$

Sol. (a) $945 \times 4 \times 25 = 945 \times (4 \times 25)$

$$= 945 \times 100 = 94500$$

(b) $40 \times 328 \times 25 = 328 \times (40 \times 25)$

$$= 328 \times 1000 = 328000$$

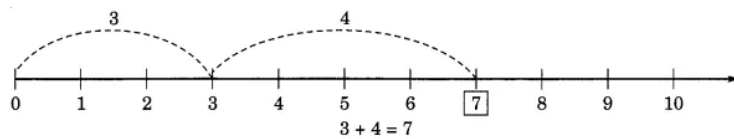
Q21. Represent the following on number line:

(a) $3 + 4$

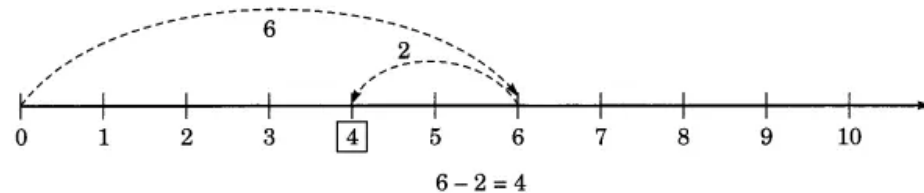
(b) $6 - 2$

(c) 2×4

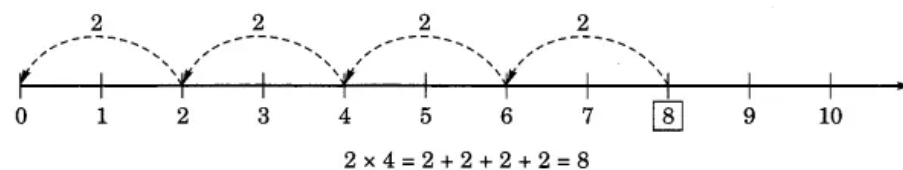
Sol. (a) $3 + 4$



(b) $6 - 2$



(c) $2 * 4$



Q22. Give one example for each of the following properties for whole numbers.

- Closure property
- Commutative property
- Associative property
- Distributive property

Sol. (a) $3 + 4 = 7$ (whole number) closure property
 (b) $4 + 5 = 5 + 4$ Commutative property
 (c) $3 + (5 + 7) = (3 + 5) + 7$ Associative property
 (d) $6 \times (8 + 3) = 6 \times 8 + 6 \times 3$ Distributive property.

Q23. A dealer purchased 124 LED sets. If the cost of one set is Rs 38,540, determine their total cost.

Sol. Total cost of 124 LED sets = Rs $(38,540 \times 124)$
 = Rs $[38,540 * (100 + 20 + 4)]$
 = Rs $[38,540 * 100 + 38,540 * 20 + 38,540 * 4]$
 = Rs $[38,54,000 + 7,70,800 + 1,54,160]$

$$= \text{Rs } 47,789,60$$

Q24. Find the product of the greatest 3-digit number and the greatest 2-digit number.

Sol. Greatest 3-digit number = 999

Greatest 2-digit number = 99

$$\therefore \text{Product} = 999 * 99 = 999 * (100 - 1)$$

$$= 999 * 100 - 999 * 1$$

$$= 99900 - 999 = 98901$$

Q25. Write 10 such numbers which can be shown only as line.

Sol. 2, 5, 7, 11, 13, 17, 19, 23, 29 and 31 are such numbers which can be shown only as line.

$$123 * 9 + 4 = 1111.$$

Q26. 320 km distance is to be covered partially by bus and partially by train. Bus covers 180 km distance with a speed of 40 km/h and the rest of the distance is covered by the train at a speed of 70 km/h. Find the time taken by a passenger to cover the whole distance.

Sol. Total distance = 320 km

Distance covered by the bus = 180 km

Speed of the bus = 40 km/h

$$\therefore \text{Time taken by the bus} = \frac{\text{Distance}}{\text{Speed}}$$

$$= \frac{180}{40} \text{ hours} = \frac{9}{2} \text{ hours}$$

Distance covered by the train = 320 - 180 = 140 km.

Speed of the train = 70 km/h

\therefore Time taken by the train

$$= \frac{\text{Distance}}{\text{Speed}} = \frac{140}{70} \text{ hours} = 2 \text{ hours.}$$

Hence, the total time taken by the passenger

$$= \frac{9}{2} \text{ hours} + 2 \text{ hours}$$

$$= 4 \text{ hours } 30 \text{ min} + 2 \text{ hours}$$

$$= 6 \text{ hours } 30 \text{ min}$$

Q27. Solve the following and establish a pattern:

- (a) $84 * 9$
- (b) $84 * 99$
- (c) $84 * 999$
- (d) $84 * 9999$

Sol. (a) $84 * 9 = 84 * (10 - 1) = 84 * 10 - 84 * 1 = 840 - 84 = 756$
(b) $84 * 99 = 84 * (100 - 1) = 84 * 100 - 84 * 1 = 8400 - 84 = 8316$
(c) $84 * 999 = 84 * (1000 - 1) = 84 * 1000 - 84 * 1 = 84000 - 84 = 83916$
(d) $84 * 9999 = 84 * (10000 - 1) = 84 * 10000 - 84 * 1 = 840000 - 84 = 839916$

Q28. Solve the following with suitable and short-cut method: .

- (a) $86 * 5$
- (b) $86 * 15$
- (c) $86 * 25$
- (d) $86 * 35$
- (e) $86 * 50$
- (f) $96 * 125$
- (g) $96 * 250$
- (h) $112 * 625$

Sol.

(a) $86 \times 5 = 86 \times \frac{10}{2} = 43 \times 10 = 430$
(b) $86 \times 15 = 86 \times \frac{30}{2} = 43 \times 30 = 43 \times (10 \times 3) = 430 \times 3 = 1290$
(c) $86 \times 25 = 86 \times \frac{100}{4} = 43 \times 50 = 43 \times (10 \times 5) = 430 \times 5 = 2150$
(d) $86 \times 35 = \frac{86 \times 70}{2} = 43 \times 70 = 43 \times (10 \times 7) = 430 \times 7 = 3010$
(e) $86 \times 50 = 86 \times \frac{100}{2} = 43 \times 100 = 4300$
(f) $96 \times 125 = 96 \times \frac{1000}{8} = 12 \times 1000 = 12000$
(g) $96 \times 250 = 96 \times \frac{1000}{4} = 24 \times 1000 = 24000$
(h) $112 \times 625 = \frac{112 \times 10000}{16} = 7 \times 10000 = 70000$

Q29. Ramesh buys 10 containers of juice from one shop and 18 containers of the same juice from another shop. If the capacity of each container is same and the cost of each of the container is Rs 150, find the total money spend by Ramesh.

Sol. Ramesh buys 10 containers from one shop Cost of 1 container = Rs 150

He buys 18 containers of the same capacity from another shop.

Cost of 1 container = Rs 150

∴ Total money spent by Ramesh

$$= \text{Rs } [10 \times 150 + 18 \times 150]$$

$$= \text{Rs } 150 \times (10 + 18)$$

$$= \text{Rs } 150 \times 28$$

$$= \text{Rs } 4200$$

Q30. Fill in the blanks.

(a) The smallest whole number is

(b) The smallest natural number is

(c) Difference between 5-digit smallest number and 4-digit largest number is

(d) Any number divided by 0 is not

(e) The property used in $84 \times 25 = 25 \times 84$ is

(f) The property used in $80 \times (60 + 3) = 80 \times 60 + 80 \times 3$ is

(g) The smallest number which can be shown by two dotted rectangles is

(h) Every whole number except is a natural number.

(i) When any counting number is multiplied by zero, the product is

(j) When zero is divided by any non-zero whole number, the quotient is

Sol. (a) The smallest whole number is 0.

(b) The smallest natural number is 1.

(c) Difference between 5-digit smallest number and 4-digit largest number is 1.

(d) Any number divided by 0 is not defined.

(e) The property used in $84 \times 25 = 25 \times 84$ is commutative property.

(f) The property used in $80 \times (60 + 3) = 80 \times 60 + 80 \times 3$ is distributive property.

(g) The smallest number which can be shown by two dotted rectangles is 6.

(h) Every whole number except 0 is a natural number.

(i) When any counting number is multiplied by zero, the product is 0.

(j) When zero is divided by any non-zero whole number, the product is 0.

Q31. Which of the following statements are true (T) and which are false (F)?

- (a) The sum of two whole numbers is always less than their product.
- (b) There is only one whole number n such that $n \times n = n$.
- (c) For two non-zero whole numbers a and b , $a \div b = b \div a$.
- (d) The sum of two odd whole numbers is an even number.
- (e) There does not exist any whole number m for which $m \div m = m$.
- (f) $(16 \div 4) \div 2 = 16 \div (4 \div 2)$

(g) $7 - 8 =$ whole number

- (h) If 1 is added to a number, we get its successor.
- (i) The whole number 15 lies between 14 and 21.
- (j) $84 \times (10 + 5) = 84 \times 10 + 84 \times 5$ represents distributive property.

- Sol.**
- (a) False statement
 - (b) False statement
 - (c) False statement
 - (d) True statement
 - (e) False statement
 - (f) False statement
 - (g) False statement
 - (h) True statement
 - (i) True statement
 - (j) True statement.

Q32. The value of $27 \div (9 \div 3)$ is

- (a) 3
- (b) 6
- (c) 9
- (d) 27

Sol. $27 \div (9 \div 3) = 27 \div \left(\frac{9}{3}\right) = 27 \div 3 = 9$

Hence, the correct option is (c).

Q33. The whole number 7 can be arranged as,

- (a) line
- (b) square

(c) rectangle

(d) triangle

Sol. 7 can be arranged as line.

Hence, the correct option is (a).

Q34. A housing complex built by DLF consists of 25 large buildings and 40 small buildings. Each large building has 15 floors with 4 apartments on each floor and each small building has 9 floors with 3 apartments on each floor. How many apartments are there in all?

Sol. Number of large buildings = 25

Number of floors = 15

Number of apartments on each floor = 4

∴ Total number of apartments in large buildings = $25 \times 15 \times 4$

Number of small building = 40

Number of floors = 9

Number of apartments on each floor = 3

∴ Total number of apartments in small buildings = $40 \times 9 \times 3$

Hence, the number of apartments in all = $25 \times 15 \times 4 + 40 \times 9 \times 3 = 1500 + 1080 = 2580$.

Q35. A school principal places orders for 85 chairs and 25 tables with a dealer. Each chair cost Rs 180 and each table cost ₹140. If the principal has given Rs 2500 to the dealer as an advance money, then what amount to be given to the dealer now?

Sol. Number of chairs = 85

Cost of one chair = Rs 180

Cost of 85 chairs = Rs (85 x 180)

Number of tables = 25

Cost of one table = Rs 140

Cost of 25 tables = Rs (25 x 140)

Total cost of all chairs and tables = ₹(85 x 180 + 25 x 140) = Rs (15300 + 3500) = Rs 18800

Money given in advance = Rs 2500

∴ Balance money to be paid to the dealer = Rs 18800 - Rs 2500 = Rs 16300