

Whole Numbers

Ex 3A

Q1

Answer :

The next three whole numbers after 30999 are 31000, 31001 and 31002.

Q2

Answer :

Three whole numbers occurring just before 10001 are as follows:

$$10001 - 1 = 10000$$

$$10000 - 1 = 9999$$

$$9999 - 1 = 9998$$

∴ The three whole numbers just before 10001 are 10000, 9999 and 9998.

Q3

Answer :

$$\begin{aligned} \text{Number of whole numbers between 1032 and 1209} &= (1209 - 1032) - 1 \\ &= 177 - 1 \\ &= 176 \end{aligned}$$

Q4

Answer :

0 (zero) is the smallest whole number.

All the natural numbers along with 0 are called whole numbers.

Q5

Answer :

- (i) Successor of 2540801 = $2540801 + 1 = 2540802$
- (ii) Successor of 9999 = $9999 + 1 = 10000$
- (iii) Successor of 50904 = $50904 + 1 = 50905$
- (iv) Successor of 61639 = $61639 + 1 = 61640$
- (v) Successor of 687890 = $687890 + 1 = 687891$
- (vi) Successor of 5386700 = $5386700 + 1 = 5386701$
- (vii) Successor of 6475999 = $6475999 + 1 = 6476000$
- (viii) Successor of 9999999 = $9999999 + 1 = 10000000$

Q6

Answer :

- (i) Predecessor of 97 = $97 - 1 = 96$
- (ii) Predecessor of 10000 = $10000 - 1 = 9999$
- (iii) Predecessor of 36900 = $36900 - 1 = 36899$
- (iv) Predecessor of 7684320 = $7684320 - 1 = 7684319$
- (v) Predecessor of 1566391 = $1566391 - 1 = 1566390$
- (vi) Predecessor of 2456800 = $2456800 - 1 = 2456799$
- (vii) Predecessor of 100000 = $100000 - 1 = 99999$
- (viii) Predecessor of 1000000 = $1000000 - 1 = 999999$

Q7

Answer :

The three consecutive whole numbers just preceding 7510001 are as follows:

$$7510001 - 1 = 7510000$$

$$7510000 - 1 = 7509999$$

$$7509999 - 1 = 7509998$$

∴ The three consecutive numbers just preceding 7510001 are 7510000, 7509999 and 7509998.

Q8

Answer :

- (i) False. 0 is not a natural number. 1 is the smallest natural number.
- (ii) True.
- (iii) False. 0 is a whole number but not a natural number.
- (iv) True. Natural numbers include 1, 2, 3 ..., which are whole numbers.
- (v) False. 0 is the smallest whole number.
- (vi) True. The predecessor of 1 is $1 - 1 = 0$, which is not a natural number.
- (vii) False. The predecessor of 1 is $1 - 1 = 0$, which is a whole number.
- (viii) True. The predecessor of 0 is $0 - 1 = -1$, which is not a whole number.
- (ix) False. The predecessor of a two-digit number can be a single digit number. For example, the predecessor of 10 is $10 - 1$, i.e., 9.
- (x) False. The successor of a two-digit number is not always a two-digit number. For example, the successor of 99 is $99 + 1$, i.e., 100.
- (xi) False. The predecessor of 499 is $499 - 1$, i.e., 498.
- (xii) True. The successor of 6999 is $6999 + 1$, i.e., 7000.

Whole Numbers

Ex 3B

Q1

Answer :

(i) $458 + 639 = 639 + 458$

(ii) $864 + 2006 = 2006 + 864$

(iii) $1946 + 984 = 984 + 1946$

(iv) $8063 + 0 = 8063$

(v) $53501 + (574 + 799) = 574 + (53501 + 799)$

Q2

Answer :

(i) $16509 + 114 = 16623$

By reversing the order of the addends, we get:

$$114 + 16509 = 16623$$

$\therefore 16509 + 114 = 114 + 16509$

(ii) $2359 + 548 = 2907$

By reversing the order of the addends, we get:

$$548 + 2359 = 2907$$

$\therefore 2359 + 548 = 548 + 2359$

(iii) $19753 + 2867 = 22620$

By reversing the order of the addends, we get:

$$2867 + 19753 = 22620$$

$\therefore 19753 + 2867 = 2867 + 19753$

Q3

Answer :

We have:

$$(1546 + 498) + 3589 = 2044 + 3589 = 5633$$

$$\text{Also, } 1546 + (498 + 3589) = 1546 + 4087 = 5633$$

Yes, the two sums are equal.

The associative property of addition is satisfied.

Q4

Answer :

$$(i) 953 + 707 + 647$$

$$953 + (707 + 647)$$

(Using associative property of addition)

$$= 953 + 1354$$

$$= 2307$$

$$(ii) 1983 + 647 + 217 + 353$$

$$(1983 + 647) + (217 + 353)$$

(Using associative property of addition)

$$= 2630 + 570$$

$$= 3200$$

$$(iii) 15409 + 278 + 691 + 422$$

$$(15409 + 278) + (691 + 422)$$

(Using associative property of addition)

$$= 15687 + 1113$$

$$= 16800$$

$$(iv) 3259 + 10001 + 2641 + 9999$$

$$(3259 + 10001) + (2641 + 9999)$$

(Using associative property of addition)

$$= 13260 + 12640$$

$$= 25900$$

$$(v) 1 + 2 + 3 + 4 + 96 + 97 + 98 + 99$$

$$(1 + 2 + 3 + 4) + (96 + 97 + 98 + 99)$$

(Using associative property of addition)

$$= (10) + (390)$$

$$= 400$$

$$(vi) 2 + 3 + 4 + 5 + 45 + 46 + 47 + 48$$

$$(2 + 3 + 4 + 5) + (45 + 46 + 47 + 48)$$

(Using associative property of addition)

$$= 14 + 186$$

$$= 200$$

Q5

Answer :

$$(i) 6784 + 9999$$

$$= 6784 + (10000 - 1)$$

$$= (6784 + 10000) - 1$$

(Using associative property of addition)

$$= 16784 - 1$$

$$= 16783$$

$$(ii) 10578 + 99999$$

$$= 10578 + (100000 - 1)$$

$$= (10578 + 100000) - 1$$

(Using associative property of addition)

$$= 110578 - 1$$

$$= 110577$$

Q6

Answer :

For any whole numbers a , b and c , we have:

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

Let $a = 2$, $b = 3$ and $c = 4$ [we can take any values for a , b and c]

$$\begin{aligned} \text{LHS} &= (a + b) + c \\ &= (2 + 3) + 4 \\ &= 5 + 4 \\ &= 9 \end{aligned}$$

$$\begin{aligned} \text{RHS} &= a + (b + c) \\ &= a + (b + c) \quad [\because \text{Whole numbers follow the commutative law}] \\ &= 2 + (3 + 4) \\ &= 2 + 7 \\ &= 9 \end{aligned}$$

\therefore This shows that associativity (in addition) is one of the properties of whole numbers.

Q7

Answer :

In a magic square, the sum of each row is equal to the sum of each column and the sum of each main diagonal. By using this concept, we have:

(i)

4	9	2
3	5	7
8	1	6

(ii)

16	2	12
6	10	14
8	18	4

(iii)

2	15	16	5
9	12	11	6
13	8	7	10
14	3	4	17

(iv)

7	18	17	4
8	13	14	11
12	9	10	15
19	6	5	16

Q8

Answer :

(i) F (false). The sum of two odd numbers may not be an odd number. Example: $3 + 5 = 8$, which is an even number.

(ii) T (true). The sum of two even numbers is an even number. Example: $2 + 4 = 6$, which is an even number.

(iii) T (true). The sum of an even and an odd number is an odd number. Example: $5 + 4 = 9$, which is an odd number.

Whole Numbers

Ex 3C

Q1

Answer :

(i) Subtraction: $6237 - 694 = 5543$
Addition: $5543 + 694 = 6237$

(ii) Subtraction: $21205 - 10899 = 10306$
Addition: $10306 + 10899 = 21205$

(iii) Subtraction: $100000 - 78987 = 21013$
Addition: $21013 + 78987 = 100000$

(iv) Subtraction: $1010101 - 656565 = 353536$
Addition: $353536 + 656565 = 1010101$

Q2

Answer :

(i) $917 - *5* = 5*8$

$$\begin{array}{r} 917 \\ - *5* \\ \hline 5*8 \end{array} \Rightarrow \begin{array}{r} 917 \\ - 359 \\ \hline 558 \end{array}$$

$\Rightarrow 917 - 359 = 558$

(ii) $6172 - **69 = 29**$

$$\begin{array}{r} 6172 \\ - **69 \\ \hline 29** \end{array} \Rightarrow \begin{array}{r} 6172 \\ - 3269 \\ \hline 2903 \end{array}$$

$\Rightarrow 6172 - 3269 = 2903$

$$(iii) 5001003 - **6987 = 484****$$

$$\begin{array}{r} 5001003 \\ - **6987 \\ \hline 484**** \end{array} \Rightarrow \begin{array}{r} 5001003 \\ - 156987 \\ \hline 4845016 \end{array}$$

$\Rightarrow 5001003 - 155987 = 4845016$

$$(iv) 1000000 - ****1 = *7042*$$

$$\begin{array}{r} 1000000 \\ - ****1 \\ \hline *7042* \end{array} \Rightarrow \begin{array}{r} 1000000 \\ - 29571 \\ \hline 970429 \end{array}$$

$\Rightarrow 1000000 - 29571 = 970429$

Q3

Answer :

$$\begin{aligned} (i) & 463 - 9 \\ &= 463 - 10 + 1 \\ &= 464 - 10 \\ &= 454 \end{aligned}$$

$$\begin{aligned} (ii) & 5632 - 99 \\ &= 5632 - 100 + 1 \\ &= 5633 - 100 \\ &= 5533 \end{aligned}$$

$$\begin{aligned} (iii) & 8640 - 999 \\ &= 8640 - 1000 + 1 \\ &= 8641 - 1000 \\ &= 7641 \end{aligned}$$

$$\begin{aligned} (iv) & 13006 - 9999 \\ &= 13006 - 10000 + 1 \\ &= 13007 - 10000 \\ &= 3007 \end{aligned}$$

Q4

Answer :

$$\begin{aligned} \text{Smallest seven-digit number} &= 1000000 \\ \text{Largest four-digit number} &= 9999 \\ \therefore \text{Their difference} &= 1000000 - 9999 \\ &= 1000000 - 10000 + 1 \\ &= 1000001 - 10000 \\ &= 990001 \end{aligned}$$

Q5

Answer :

$$\begin{aligned} \text{Money deposited by Ravi} &= \text{Rs } 1,36,000 \\ \text{Money withdrawn by Ravi} &= \text{Rs } 73,129 \\ \text{Money left in his account} &= \text{money deposited} - \text{money withdrawn} \\ &= \text{Rs } (136000 - 73129) \\ &= \text{Rs } 62871 \end{aligned}$$

\therefore Rs 62,871 is left in Ravi's account.

Q6

Answer :

Money withdrawn by Mrs Saxena = Rs 1,00,000
Cost of the TV set = Rs 38,750
Cost of the refrigerator = Rs 23,890
Cost of the jewellery = Rs 35,560
Total money spent = Rs (38750 + 23890 + 35560) = Rs 98200

Now, money left = money withdrawn – money spent
= Rs (100000 – 98200)
= Rs 1800

∴ Rs 1,800 is left with Mrs Saxena.

Q7

Answer :

Population of the town = 110500
Increased population = 110500 + 3608 = 114108
Number of persons who died or left the town = 8973
Population at the end of the year = 114108 – 8973 = 105135

∴ The population at the end of the year will be 105135.

Q8

Answer :

$$(i) n + 4 = 9 \\ \Rightarrow n = 9 - 4 = 5$$

$$(ii) n + 35 = 101 \\ \Rightarrow n = 101 - 35 = 66$$

$$(iii) n - 18 = 39 \\ \Rightarrow n = 18 + 39 = 57$$

$$(iv) n - 20568 = 21403 \\ \Rightarrow n = 21403 + 20568 = 41971$$

Whole Numbers

Ex 3D

Q1

Answer :

(i) $246 \times 1 = 246$

(ii) $1369 \times 0 = 0$

(iii) $593 \times 188 = 188 \times 593$

(iv) $286 \times 753 = 753 \times 286$

(v) $38 \times (91 \times 37) = 91 \times (38 \times 37)$

(vi) $13 \times 100 \times 1000 = 1300000$

(vii) $59 \times 66 + 59 \times 34 = 59 \times (66 + 34)$

(viii) $68 \times 95 = 68 \times 100 - 68 \times 5$

Q2

Answer :

(i) Commutative law in multiplication

(ii) Closure property

(iii) Associativity of multiplication

(iv) Multiplicative identity

(v) Property of zero

(vi) Distributive law of multiplication over addition

(vii) Distributive law of multiplication over subtraction

Q3

Answer :

$$\begin{aligned} \text{(i)} & 647 \times 13 + 647 \times 7 \\ &= 647 \times (13 + 7) \\ &= 647 \times 20 \\ &= 12940 \end{aligned} \quad \text{(By using distributive property)}$$

$$\begin{aligned} \text{(ii)} & 8759 \times 94 + 8759 \times 6 \\ &= 8759 \times (94 + 6) \\ &= 8759 \times 100 \\ &= 875900 \end{aligned} \quad \text{(By using distributive property)}$$

$$\begin{aligned} \text{(iii)} & 7459 \times 999 + 7459 \\ &= 7459 \times (999 + 1) \\ &= 7459 \times 1000 \\ &= 7459000 \end{aligned} \quad \text{(By using distributive property)}$$

$$\begin{aligned} \text{(iv)} & 9870 \times 561 - 9870 \times 461 \\ &= 9870 \times (561 - 461) \\ &= 9870 \times 100 \\ &= 987000 \end{aligned} \quad \text{(By using distributive property)}$$

$$\begin{aligned} \text{(v)} & 569 \times 17 + 569 \times 13 + 569 \times 70 \\ &= 569 \times (17 + 13 + 70) \\ &= 569 \times 100 \\ &= 56900 \end{aligned} \quad \text{(By using distributive property)}$$

$$\begin{aligned} \text{(vi)} & 16825 \times 16825 - 16825 \times 6825 \\ &= 16825 \times (16825 - 6825) \\ &= 16825 \times 10000 \\ &= 168250000 \end{aligned} \quad \text{(By using distributive property)}$$

Q4

Answer :

$$\begin{aligned} \text{(i)} & 2 \times 1658 \times 50 \\ &= (2 \times 50) \times 1658 \\ &= 100 \times 1658 \\ &= 165800 \end{aligned}$$

$$\begin{aligned} \text{(ii)} & 4 \times 927 \times 25 \\ &= (4 \times 25) \times 927 \\ &= 100 \times 927 \\ &= 92700 \end{aligned}$$

$$\begin{aligned} \text{(iii)} & 625 \times 20 \times 8 \times 50 \\ &= (20 \times 50) \times 8 \times 625 \\ &= 1000 \times 8 \times 625 \\ &= 8000 \times 625 \\ &= 5000000 \end{aligned}$$

$$\begin{aligned} \text{(iv)} & 574 \times 625 \times 16 \\ &= 574 \times (625 \times 16) \\ &= 574 \times 10000 \\ &= 5740000 \end{aligned}$$

$$\begin{aligned} \text{(v)} & 250 \times 60 \times 50 \times 8 \\ &= (250 \times 8) \times (60 \times 50) \\ &= 2000 \times 3000 \\ &= 6000000 \end{aligned}$$

$$\begin{aligned} \text{(vi)} & 8 \times 125 \times 40 \times 25 \\ &= (8 \times 125) \times (40 \times 25) \\ &= 1000 \times 1000 \\ &= 1000000 \end{aligned}$$

Q5

Answer :

$$\begin{aligned} \text{(i) } & 740 \times 105 \\ & = 740 \times (100 + 5) \\ & = 740 \times 100 + 740 \times 5 && \text{(Using distributive law of multiplication over addition)} \\ & = 74000 + 3700 \\ & = 77700 \end{aligned}$$

$$\begin{aligned} \text{(ii) } & 245 \times 1008 \\ & = 245 \times (1000 + 8) \\ & = 245 \times 1000 + 245 \times 8 && \text{(Using distributive law of multiplication over addition)} \\ & = 245000 + 1960 \\ & = 246960 \end{aligned}$$

$$\begin{aligned} \text{(iii) } & 947 \times 96 \\ & = 947 \times (100 - 4) \\ & = 947 \times 100 - 947 \times 4 && \text{(Using distributive law of multiplication over subtraction)} \\ & = 94700 - 3788 \\ & = 90912 \end{aligned}$$

$$\begin{aligned} \text{(iv) } & 996 \times 367 \\ & = 367 \times (1000 - 4) \\ & = 367 \times 1000 - 367 \times 4 && \text{(Using distributive law of multiplication over subtraction)} \\ & = 367000 - 1468 \\ & = 365532 \end{aligned}$$

Q6

Answer :

Distributive property of multiplication over addition states that $a(b + c) = ab + ac$

Distributive property of multiplication over subtraction states that $a(b - c) = ab - ac$

$$\begin{aligned} \text{(i) } & 3576 \times 9 \\ & = 3576 \times (10 - 1) \\ & = 3576 \times 10 - 3576 \times 1 \\ & = 35760 - 3576 \\ & = 32184 \end{aligned}$$

$$\begin{aligned} \text{(ii) } & 847 \times 99 \\ & = 847 \times (100 - 1) \\ & = 847 \times 100 - 847 \times 1 \\ & = 84700 - 847 \\ & = 83853 \end{aligned}$$

$$\begin{aligned} \text{(iii) } & 2437 \times 999 \\ & = 2437 \times (1000 - 1) \\ & = 2437 \times 1000 - 2437 \times 1 \\ & = 2437000 - 2437 \\ & = 2434563 \end{aligned}$$

Q7

Answer :

$$\begin{array}{r} \text{(i)} \\ 456 \\ \times 67 \\ \hline 3206 \quad \text{Multiplication by 7} \\ 27480 \quad \text{Multiplication by 60} \\ \hline 30686 \end{array}$$

$$458 \times 67 = 30686$$

$$\begin{array}{r} \text{(ii)} \\ 3709 \\ \times 89 \\ \hline 33381 \quad \text{Multiplication by 9} \\ 296720 \quad \text{Multiplication by 80} \\ \hline 330101 \end{array}$$

$$3709 \times 89 = 330101$$

(iii)

$$\begin{array}{r} 4617 \\ \times 234 \\ \hline 18468 \text{ Multiplication by 4} \\ 138510 \text{ Multiplication by 30} \\ 923400 \text{ Multiplication by 200} \\ \hline 1080378 \end{array}$$

$$4617 \times 234 = 1080378$$

(iv)

$$\begin{array}{r} 15208 \\ \times 542 \\ \hline 30416 \text{ Multiplication by 2} \\ 608320 \text{ Multiplication by 40} \\ 7604000 \text{ Multiplication by 500} \\ \hline 8242736 \end{array}$$

$$15208 \times 542 = 8242736$$

Q8

Answer :

Largest three-digit number = 999

Largest five-digit number = 99999

\therefore Product of the two numbers = 999×99999

$$\begin{aligned} &= 999 \times (100000 - 1) && \text{(Using distributive law)} \\ &= 99900000 - 999 \\ &= 99899001 \end{aligned}$$

Q9

Answer :

Uniform speed of a car = 75 km/h

Distance = speed \times time

$$\begin{aligned} &= 75 \times 98 \\ &= 75 \times (100 - 2) && \text{(Using distributive law)} \\ &= 75 \times 100 - 75 \times 2 \\ &= 7500 - 150 \\ &= 7350 \text{ km} \end{aligned}$$

\therefore The distance covered in 98 h is 7350 km.

Q10

Answer :

Cost of 1 VCR set = Rs 24350

Cost of 139 VCR sets = 139×24350

$$\begin{aligned} &= 24350 \times (140 - 1) && \text{(Using distributive property)} \\ &= 24350 \times 140 - 24350 \\ &= 3409000 - 24350 \\ &= \text{Rs. } 3384650 \end{aligned}$$

\therefore The cost of all the VCR sets is Rs 33,84,650.

Q11

Answer :

Cost of construction of 1 house = Rs 450000

Cost of construction of 197 such houses = 197×450000

$$= 450000 \times (200 - 3)$$

$$= 450000 \times 200 - 450000 \times 3$$

[Using distributive

property of multiplication over subtraction]

$$= 90000000 - 1350000$$

$$= 88650000$$

∴ The total cost of construction of 197 houses is Rs 8,86,50,000.

Q12

Answer :

Cost of a chair = Rs 1065

Cost of a blackboard = Rs 1645

Cost of 50 chairs = 50×1065 = Rs 53250

Cost of 30 blackboards = 30×1645 = Rs 49350

∴ Total amount of the bill = cost of 50 chairs + cost of 30 blackboards

$$= \text{Rs } (53250 + 49350)$$

$$= \text{Rs } 1,02,600$$

Q13

Answer :

Number of student in 1 section = 45

Number of students in 6 sections = 45×6 = 270

Monthly charges from 1 student = Rs 1650

∴ Total monthly collection from class VI = $\text{Rs } 1650 \times 270$ = Rs 4,45,500

Q14

Answer :

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

Example: $0 \times 2 = 0$ and $0 \times 15 = 0$

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

i.e., $0 \times 0 = 0$

Now, $2 \times 5 = 10$. Here, the product will be non-zero because the numbers to be multiplied are not equal to zero.

Q15

Answer :

(i) Sum of two odd numbers is an even number. Example: $3 + 5 = 8$, which is an even number.

(ii) Product of two odd numbers is an odd number. Example: $5 \times 7 = 35$, which is an odd number.

(iii) $a \neq 0$ and $a \times a = a$

Given: $a \times a = a$

$$\Rightarrow a = \frac{a}{a} = 1, a \neq 0$$

Whole Numbers

Ex 3E

Q1

Answer :

(i)

$$\begin{array}{r} 53 \\ 36 \overline{)1936} \\ \underline{-180} \\ 136 \\ \underline{-108} \\ 28 \end{array}$$

Dividend = 1936, Divisor = 36 , Quotient = 53 , Remainder = 28

Check: Divisor \times Quotient + Remainder = $36 \times 53 + 28$

$$= 1936$$

$$= \text{Dividend}$$

Hence, Dividend = Divisor \times Quotient + Remainder

Verified.

(ii) $19881 \div 47$

$$\begin{array}{r} 423 \\ 47 \overline{)19881} \\ \underline{-188} \\ 108 \\ \underline{-94} \\ 141 \\ \underline{-141} \\ 0 \end{array}$$

Dividend = 19881, Divisor = 47 , Quotient = 423, Remainder = 0

Check: Divisor \times Quotient + Remainder = $47 \times 423 + 0$

$$= 19881$$

$$= \text{Dividend}$$

Hence, Dividend = Divisor \times Quotient + Remainder

Verified.

(iii)

$$\begin{array}{r} 756 \\ 341 \overline{)257796} \\ \underline{-2387} \\ 1909 \\ \underline{-1705} \\ 2046 \\ \underline{-2046} \\ 0 \end{array}$$

Dividend = 257796 , Divisor = 341 , Quotient = 756 , Remainder = 0

$$\begin{aligned} \text{Check : Divisor} \times \text{Quotient} + \text{Remainder} &= 341 \times 756 + 0 \\ &= 257796 \\ &= \text{Dividend} \end{aligned}$$

Hence, Dividend = Divisor \times Quotient + Remainder
Verified.

(iv) $612846 \div 582$

$$\begin{array}{r} 1053 \\ 582 \overline{)612846} \\ \underline{-582} \\ 3084 \\ \underline{-2910} \\ 1746 \\ \underline{-1746} \\ 0 \end{array}$$

Dividend = 612846 , Divisor = 582 , Quotient = 1053 , Remainder = 0

$$\begin{aligned} \text{Check : Divisor} \times \text{Quotient} + \text{Remainder} &= 582 \times 1053 + 0 \\ &= 612846 \\ &= \text{Dividend} \end{aligned}$$

Hence, Dividend = Divisor \times Quotient + Remainder
Verified.

(v) $34419 \div 149$

$$\begin{array}{r} 231 \\ 149 \overline{)34419} \\ \underline{-298} \\ 461 \\ \underline{-447} \\ 149 \\ \underline{-149} \\ 0 \end{array}$$

Dividend = 34419 , Divisor = 149 , Quotient = 231 , Remainder = 0

$$\begin{aligned} \text{Check : Divisor} \times \text{Quotient} + \text{Remainder} &= 149 \times 231 + 0 \\ &= 34419 \\ &= \text{Dividend} \end{aligned}$$

Hence, Dividend = Divisor \times Quotient + Remainder
Verified.

(vi) $39039 \div 1001$

$$\begin{array}{r} 39 \\ 1001 \overline{)39039} \\ \underline{-3003} \\ 9009 \\ \underline{-9009} \\ 0 \end{array}$$

Dividend = 39039 , Divisor = 1001 , Quotient = 39 , Remainder = 0

$$\begin{aligned} \text{Check : Divisor} \times \text{Quotient} + \text{Remainder} &= 1001 \times 39 + 0 \\ &= 39039 \\ &= \text{Dividend} \end{aligned}$$

Hence, Dividend = Divisor \times Quotient + Remainder
Verified.

Q2

Answer :

(i) $6971 \div 47$

$$\begin{array}{r} 148 \\ 47 \overline{) 6971} \\ \underline{-47} \\ 227 \\ \underline{-188} \\ 391 \\ \underline{-376} \\ 15 \end{array}$$

Quotient = 148 and Remainder = 15

$$\begin{aligned} \text{Check: Divisor} \times \text{Quotient} + \text{Remainder} &= 47 \times 148 + 15 \\ &= 6971 \\ &= \text{Dividend} \end{aligned}$$

\therefore Dividend = Divisor \times Quotient + Remainder

Verified.

(ii) $4178 \div 35$

$$\begin{array}{r} 119 \\ 35 \overline{) 4178} \\ \underline{-35} \\ 67 \\ \underline{-35} \\ 328 \\ \underline{-315} \\ 13 \end{array}$$

Dividend = 119 and Remainder = 13

$$\begin{aligned} \text{Check: Divisor} \times \text{Quotient} + \text{remainder} &= 35 \times 119 + 13 \\ &= 4178 \\ &= \text{Dividend} \end{aligned}$$

\therefore Dividend = Divisor \times Quotient + Remainder

Verified.

(iii) $36195 \div 153$

$$\begin{array}{r} 236 \\ 153 \overline{) 36195} \\ \underline{-306} \\ 559 \\ \underline{-459} \\ 1005 \\ \underline{-918} \\ 87 \end{array}$$

Quotient = 236 and Remainder = 87

$$\begin{aligned} \text{Check: Divisor} \times \text{Quotient} + \text{Remainder} &= 153 \times 236 + 87 \\ &= 36195 \\ &= \text{Dividend} \end{aligned}$$

\therefore Dividend = Divisor \times Quotient + Remainder

Verified.

(iv) $93575 \div 400$

$$\begin{array}{r} 233 \\ 400 \overline{) 93575} \\ \underline{800} \\ 1357 \\ \underline{-1200} \\ 1575 \\ \underline{-1200} \\ 375 \end{array}$$

Quotient = 233 and Remainder = 375

$$\begin{aligned} \text{Check: Divisor} \times \text{Quotient} + \text{Remainder} &= 400 \times 233 + 375 \\ &= 93575 \\ &= \text{Dividend} \end{aligned}$$

$\therefore \text{Dividend} = \text{Divisor} \times \text{Quotient} + \text{Remainder}$
Verified.

(v) $23025 \div 1000$

$$\begin{array}{r} 23 \\ 1000 \overline{) 23025} \\ \underline{2000} \\ 3025 \\ \underline{-3000} \\ 25 \end{array}$$

Quotient = 23 and remainder = 25

$$\begin{aligned} \text{Check: Divisor} \times \text{Quotient} + \text{Remainder} &= 1000 \times 23 + 25 \\ &= 23025 \\ &= \text{Dividend} \end{aligned}$$

$\therefore \text{Dividend} = \text{Divisor} \times \text{Quotient} + \text{Remainder}$
Verified.

(vi) $16135 \div 875$

$$\begin{array}{r} 18 \\ 875 \overline{) 16135} \\ \underline{-875} \\ 7385 \\ \underline{-7000} \\ 385 \end{array}$$

Quotient = 18 and Remainder = 385

$$\begin{aligned} \text{Check: Divisor} \times \text{Quotient} + \text{Remainder} &= 875 \times 18 + 385 \\ &= 16135 \\ &= \text{Dividend} \end{aligned}$$

$\therefore \text{Dividend} = \text{Divisor} \times \text{Quotient} + \text{Remainder}$
Verified.

Q3

Answer :

(i) $65007 \div 1 = 65007$

(ii) $0 \div 879 = 0$

(iii) $981 + 5720 \div 10$

$= 981 + (5720 \div 10)$ (Following DMAS property)

$= 981 + 572$

$= 1553$

(iv) $1507 - (625 \div 25)$

(Following BODMAS property)

$= 1507 - 25$

$= 1482$

(v) $32277 \div (648 - 39)$

(Following BODMAS property)

$= 32277 \div (609)$

$= 53$

(vi) $(1573 \div 1573) - (1573 \div 1573)$

(Following BODMAS property)

$= 1 - 1$

$= 0$

Q4

Answer :

Given: $n \div n = n$

$$\Rightarrow \frac{n}{n} = n$$

$$\Rightarrow n = n^2$$

i.e., the whole number n is equal to n^2 .

\therefore The given whole number must be 1.

Q5

Answer :

Let x and y be the two numbers.

Product of the two numbers = $x \times y = 504347$

If $x = 317$, we have:

$$317 \times y = 504347$$

$$\Rightarrow y = 504347 \div 317$$

$$\begin{array}{r} 1591 \\ 317 \overline{)504347} \\ \underline{-317} \\ 1873 \\ \underline{-1585} \\ 2884 \\ \underline{-2853} \\ 317 \\ \underline{-317} \\ 0 \end{array}$$

$$y = 1591$$

\therefore The other number is 1591.

Q6

Answer :

Dividend = 59761, quotient = 189, remainder = 37 and divisor = ?

Dividend = divisor \times quotient + remainder

$$\Rightarrow 59761 = \text{divisor} \times 189 + 37$$

$$\Rightarrow 59761 - 37 = \text{divisor} \times 189$$

$$\Rightarrow 59724 = \text{divisor} \times 189$$

$$\Rightarrow \text{Divisor} = 59724 \div 189$$

$$\begin{array}{r} 316 \\ 189 \overline{)59724} \\ \underline{-567} \\ 302 \\ \underline{-189} \\ 1134 \\ \underline{-1134} \\ 0 \end{array}$$

Hence, divisor = 316

Q7

Answer :

Here, Dividend = 55390, Divisor = 299 and Remainder = 75

We have to find the quotient.

Now, Dividend = Divisor \times Quotient + Remainder

$$\Rightarrow 55390 = 299 \times \text{Quotient} + 75$$

$$\Rightarrow 55390 - 75 = 299 \times \text{Quotient}$$

$$\Rightarrow 55315 = 299 \times \text{Quotient}$$

$$\Rightarrow \text{Quotient} = 55315 \div 299$$

$$\begin{array}{r} 185 \\ 299 \overline{) 55315} \\ \underline{299} \\ 2541 \\ \underline{2392} \\ 1495 \\ \underline{1495} \\ 0 \end{array}$$

Hence, quotient = 185

Q8

Answer :

First, we will divide 13601 by 87.

$$\begin{array}{r} 156 \\ 87 \overline{) 13601} \\ \underline{87} \\ 490 \\ \underline{435} \\ 551 \\ \underline{522} \\ 29 \end{array}$$

Remainder = 29

So, 29 must be subtracted from 13601 to get a number exactly divisible by 87.

$$\text{i.e., } 13601 - 29 = 13572$$

Now, we have:

$$\begin{array}{r} 156 \\ 87 \overline{) 13572} \\ \underline{87} \\ 487 \\ \underline{435} \\ 522 \\ \underline{522} \\ 0 \end{array}$$

\therefore 29 must be subtracted from 13601 to make it divisible by 87.

Q9

Answer :

First, we will divide 1056 by 23.

$$\begin{array}{r} 45 \\ 23 \overline{)1056} \\ \underline{-92} \\ 136 \\ \underline{-115} \\ 21 \end{array}$$

Required number = $23 - 21 = 2$

So, 2 must be added to 1056 to make it exactly divisible by 23.

i.e., $1056 + 2 = 1058$

Now, we have:

$$\begin{array}{r} 46 \\ 23 \overline{)1058} \\ \underline{-92} \\ 138 \\ \underline{-138} \\ 0 \end{array}$$

\therefore 1058 is exactly divisible by 23.

Q10

Answer :

We have to find the largest four digit number divisible by 16 .

The largest four-digit number = 9999

Therefore, dividend =9999

Divisor =16

$$\begin{array}{r} 62 \\ 16 \overline{)9999} \\ \underline{-96} \\ 39 \\ \underline{-32} \\ 79 \\ \underline{-64} \\ 15 \end{array}$$

Here, we get remainder =15

Therefore, 15 must be subtracted from 9999 to get the largest four digit number that is divisible by 16.

i.e., $9999 - 15 = 9984$

Thus, 9984 is the largest four-digit number that is divisible by 16.

Q11

Answer :

Largest five-digit number =99999

$$\begin{array}{r} 153 \\ 653 \overline{)99999} \\ \underline{-653} \\ 3469 \\ \underline{-3265} \\ 2049 \\ \underline{-1959} \\ 90 \end{array}$$

Dividend = 99999, Divisor = 653, Quotient = 153 and Remainder = 90

Check: Divisor \times Quotient + Remainder

$$= 653 \times 153 + 90$$

$$= 99909 + 90$$

$$= 99999$$

$$= \text{Dividend}$$

\therefore Dividend = Divisor \times Quotient + Remainder

Verified.

Q12

Answer :

Least six-digit number = 100000

Here, dividend = 100000 and divisor = 83

$$\begin{array}{r} 1204 \\ 83 \overline{)99932} \\ \underline{83} \\ 169 \\ \underline{166} \\ 332 \\ \underline{332} \\ 0 \end{array}$$

In order to find a number exactly divisible by 83, we have to subtract the remainder from the dividend.

i.e., $100000 - 68 = 99932$

So, 99932 is the least six-digit number exactly divisible by 83.

$$\begin{array}{r} 1204 \\ 83 \overline{)99932} \\ \underline{-83} \\ 169 \\ \underline{-166} \\ 332 \\ \underline{-332} \\ 0 \end{array}$$

Q13

Answer :

Cost of 1 dozen bananas = Rs 29

Number of dozens purchased for Rs 1392 = $1392 \div 29$

$$\begin{array}{r} 48 \\ 29 \overline{)1392} \\ \underline{-116} \\ 232 \\ \underline{-232} \\ 0 \end{array}$$

Hence, 48 dozen of bananas can be purchased with Rs. 1392.

Q14

Answer :

Number of trees planted in 157 rows = 19625

Trees planted in 1 row = $19625 \div 157$

$$\begin{array}{r} 125 \\ 157 \overline{)19625} \\ \underline{-157} \\ 392 \\ \underline{-314} \\ 785 \\ \underline{-785} \\ 0 \end{array}$$

\therefore 125 trees are planted in each row.

Q15

Answer :

Population of the town = 517530

$\left(\frac{1}{15}\right)$ of the population is reported to be literate, i.e., $\left(\frac{1}{15}\right) \times 517530 = 517530 \div 15$

$$\begin{array}{r} 34502 \\ 15 \overline{) 517530} \\ \underline{-45} \\ 67 \\ \underline{-60} \\ 75 \\ \underline{-75} \\ 030 \\ \underline{-30} \\ 0 \end{array}$$

\therefore There are 34502 illiterate persons in the given town.

Q16

Answer :

Cost price of 23 colour TV sets = Rs 5,70,055

Cost price of 1 TV set = Rs 570055 \div 23

$$\begin{array}{r} 24785 \\ 23 \overline{) 570055} \\ \underline{-46} \\ 110 \\ \underline{-92} \\ 180 \\ \underline{-161} \\ 195 \\ \underline{-184} \\ 115 \\ \underline{-115} \\ 0 \end{array}$$

\therefore The cost price of one TV set is Rs 24,785.

Whole Numbers

Ex 3F

Q1

Answer :

(b) 0

The smallest whole number is 0.

Q2

Answer :

(d) 1008

(a)

$$\begin{array}{r} 113 \\ 9 \overline{)1018} \\ \underline{-9} \\ 11 \\ \underline{-9} \\ 28 \\ \underline{-27} \\ 1 \end{array}$$

Hence, 1018 is not exactly divisible by 9.

(b)

$$\begin{array}{r} 114 \\ 9 \overline{)1026} \\ \underline{-9} \\ 12 \\ \underline{-9} \\ 36 \\ \underline{-36} \\ 1 \end{array}$$

Hence, 1026 is exactly divisible by 9.

(c)

$$\begin{array}{r} 112 \\ 9 \overline{)1009} \\ \underline{-9} \\ 10 \\ \underline{-9} \\ 19 \\ \underline{-18} \\ 1 \end{array}$$

Hence, 1009 is not exactly divisible by 9.

(d)

$$\begin{array}{r} 112 \\ 9 \overline{)1008} \\ \underline{-9} \\ 10 \\ \underline{-9} \\ 18 \\ \underline{-18} \\ 0 \end{array}$$

Hence, 1008 is exactly divisible by 9.

(b) and (d) are exactly divisible by 9, but (d) is the least number which is exactly divisible by 9.

(b)

$$\begin{array}{r} 62498 \\ 16 \overline{)999982} \\ \underline{-96} \\ 39 \\ \underline{-32} \\ 79 \\ \underline{-64} \\ 158 \\ \underline{-144} \\ 142 \\ \underline{-128} \\ 14 \end{array}$$

Hence, 999982 is not exactly divisible by 16.

(c)

$$\begin{array}{r} 62499 \\ 16 \overline{)999984} \\ \underline{-96} \\ 39 \\ \underline{-32} \\ 79 \\ \underline{-64} \\ 158 \\ \underline{-144} \\ 144 \\ \underline{-144} \\ 0 \end{array}$$

Hence, 999984 is exactly divisible by 16.

(d)

$$\begin{array}{r} 62497 \\ 16 \overline{) 999964} \\ \underline{-96} \\ 39 \\ \underline{-32} \\ 79 \\ \underline{-64} \\ 156 \\ \underline{-144} \\ 124 \\ \underline{-112} \\ 12 \end{array}$$

Hence, 999964 is not exactly divisible by 16.

The largest six-digit number which is exactly divisible by 16 is 999984.

Q4

Answer :

(c) 8

Here we have to tell what least number should be subtracted from 10004 to get a number exactly divisible by 12

So, we will first divide 10004 by 12.

$$\begin{array}{r} 833 \\ 12 \overline{) 10004} \\ \underline{-96} \\ 40 \\ \underline{-36} \\ 44 \\ \underline{-36} \\ 8 \end{array}$$

Remainder = 8

So, 8 should be subtracted from 10004 to get the number exactly divisible by 12.

i.e., $10004 - 8 = 9996$

$$\begin{array}{r} 833 \\ 12 \overline{) 9996} \\ \underline{-96} \\ 39 \\ \underline{-36} \\ 36 \\ \underline{-36} \\ 0 \end{array}$$

Hence, 9996 is exactly divisible by 12.

Q5

Answer :

(a) 18

Here , we have to tell that what least number must be added to 10056 to get a number exactly divisible by 23

So, first we will divide 10056 by 23

$$\begin{array}{r} 437 \\ 23 \overline{)10056} \\ \underline{-92} \\ 85 \\ \underline{-69} \\ 166 \\ \underline{-161} \\ 5 \end{array}$$

Remainder = 5

Required number = $23 - 5 = 18$

So, 18 must be added to 10056 to get a number exactly divisible by 23.

i.e., $10056 + 18 = 10074$

$$\begin{array}{r} 438 \\ 23 \overline{)10074} \\ \underline{-92} \\ 87 \\ \underline{-69} \\ 184 \\ \underline{-184} \\ 0 \end{array}$$

Hence, 10074 is exactly divisible by 23 .

Q6

Answer :

(d) 462

(a)

$$\begin{array}{r} 4 \\ 11 \overline{)450} \\ \underline{-44} \\ 10 \end{array}$$

Hence, 450 is not divisible by 11.

(b)

$$\begin{array}{r} 41 \\ 11 \overline{)451} \\ \underline{-44} \\ 11 \\ \underline{-11} \\ 0 \end{array}$$

Hence, 451 is divisible by 11.

(c)

$$\begin{array}{r} 41 \\ 11 \overline{)460} \\ \underline{-44} \\ 20 \\ \underline{-11} \\ 9 \end{array}$$

Hence, 460 is not divisible by 11.

(d)

$$\begin{array}{r} 42 \\ 11 \overline{)462} \\ \underline{-44} \\ 22 \\ \underline{-22} \\ 0 \end{array}$$

Hence, 462 is divisible by 11.

Here, the numbers given in options (b) and (d) are divisible by 11. However, we want a whole number nearest to 457 which is divisible by 11.

So, 462 is whole number nearest to 457 and divisible by 11.

Q7

Answer :

(c) 184

$$\begin{aligned} \text{Number of whole numbers} &= (1203 - 1018) - 1 \\ &= 185 - 1 \\ &= 184 \end{aligned}$$

Q8

Answer :

(b) 521

Divisor = 46

Quotient = 11

Remainder = 15

$$\begin{aligned} \text{Dividend} &= \text{divisor} \times \text{quotient} + \text{remainder} \\ &= 46 \times 11 + 15 \\ &= 506 + 15 \\ &= 521 \end{aligned}$$

Q9

Answer :

(c) 12

Dividend = 199

Quotient = 16

Remainder = 7

According to the division algorithm, we have:

Dividend = divisor \times quotient + remainder

$$\Rightarrow 199 = \text{divisor} \times 16 + 7$$

$$\Rightarrow 199 - 7 = \text{divisor} \times 16$$

$$\Rightarrow \text{Divisor} = 192 \div 16$$

$$\begin{array}{r} 12 \\ 16 \overline{)192} \\ \underline{-16} \\ 32 \\ \underline{-32} \\ 0 \end{array}$$

Q10

Answer :

(a) 11023

$$\begin{aligned}7589 - ? &= 3434 \\ \Rightarrow 7589 - x &= 3434 \\ \Rightarrow x &= 7589 + 3434 \\ \Rightarrow x &= 11023\end{aligned}$$

Q11

Answer :

(c) 58113

$$\begin{aligned}587 \times 99 \\ &= 587 \times (100 - 1) \\ &= 587 \times 100 - 587 \times 1 \quad \text{[Using distributive property of multiplication over subtraction]} \\ &= 58700 - 587 \\ &= 58113\end{aligned}$$

Q12

Answer :

(c) 53800

$$\begin{aligned}4 \times 538 \times 25 \\ &= (4 \times 25) \times 538 \\ &= 100 \times 538 \\ &= 53800\end{aligned}$$

Q13

Answer :

(c) 2467900

By using the distributive property, we have:

$$\begin{aligned}24679 \times 92 + 24679 \times 8 \\ &= 24679 \times (92 + 8) \\ &= 24679 \times 100 \\ &= 2467900\end{aligned}$$

Q14

Answer :

(a) 1625000

By using the distributive property, we have:

$$\begin{aligned}1625 \times 1625 - 1625 \times 625 \\ &= 1625 \times (1625 - 625) \\ &= 1625 \times 1000 \\ &= 1625000\end{aligned}$$

Q15

Answer :

(c) 156800

By using the distributive property, we have:

$$\begin{aligned}1568 \times 185 - 1568 \times 85 \\ &= 1568 \times (185 - 85) \\ &= 1568 \times 100 \\ &= 156800\end{aligned}$$

Q16

Answer :

(c) 20

$$\begin{aligned}(888 + 777 + 555) &= (111 \times ?) \\ \Rightarrow (888 + 777 + 555) &= 111 \times (8 + 7 + 5) \quad [\text{By taking 111 common}] \\ &= 111 \times (20) = 2220\end{aligned}$$

Q17

Answer :

(b) an even number

The sum of two odd numbers is an even number.

Example: $5 + 3 = 8$

Q18

Answer :

(a) an odd number

The product of two odd numbers is an odd number.

Example: $5 \times 3 = 15$

Q19

Answer :

(d) none of these

Given: a is a whole number such that $a + a = a$.

If $a = 1$, then $1 + 1 = 2 \neq 1$

If $a = 2$, then $2 + 2 = 4 \neq 2$

If $a = 3$, then $3 + 3 = 6 \neq 3$

Q20

Answer :

(b) 9999

Predecessor of 10000 = $10000 - 1 = 9999$

Q21

Answer :

(b) 1002

Successor of 1001 = $1001 + 1 = 1002$

Q22

Answer :

(b) 2

The smallest even whole number is 2. Zero (0) is neither an even number nor an odd number.