

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]

$$\text{LHS} = (a + b) + c$$

$$= (2 + 3) + 4$$

$$= 5 + 4$$

$$= 9$$

$$\text{RHS} = a + (b + c)$$

$$= a + (b + c) \quad [\because \text{Whole numbers follow the commutative law}]$$

$$= 2 + (3 + 4)$$

$$= 2 + 7$$

$$= 9$$

\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

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Answer :

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

(By using distributive property)

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

(By using distributive property)

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

(By using distributive property)

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

(By using distributive property)

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

(By using distributive property)

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

(By using distributive property)

Q4

Answer :

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

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

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

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

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

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

Q5

Answer :

(i) 740×105
 $= 740 \times (100 + 5)$
 $= 740 \times 100 + 740 \times 5$ (Using distributive law of multiplication over addition)
 $= 74000 + 3700$
 $= 77700$

(ii) 245×1008
 $= 245 \times (1000 + 8)$
 $= 245 \times 1000 + 245 \times 8$ (Using distributive law of multiplication over addition)
 $= 245000 + 1960$
 $= 246960$

(iii) 947×96
 $= 947 \times (100 - 4)$
 $= 947 \times 100 - 947 \times 4$ (Using distributive law of multiplication over subtraction)
 $= 94700 - 3788$
 $= 90912$

(iv) 996×367
 $= 367 \times (1000 - 4)$
 $= 367 \times 1000 - 367 \times 4$ (Using distributive law of multiplication over subtraction)
 $= 367000 - 1468$
 $= 365532$

Q6

Answer :

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

(i) 3576×9
 $= 3576 \times (10 - 1)$
 $= 3576 \times 10 - 3576 \times 1$
 $= 35760 - 3576$
 $= 32184$

(ii) 847×99
 $= 847 \times (100 - 1)$
 $= 847 \times 100 - 847 \times 1$
 $= 84700 - 847$
 $= 83853$

(iii) 2437×999
 $= 2437 \times (1000 - 1)$
 $= 2437 \times 1000 - 2437 \times 1$
 $= 2437000 - 2437$
 $= 2434563$

Q7

Answer :

(i)

4 5 6	
<u>× 6 7</u>	
3 2 0 6	Multiplication by 7
<u>2 7 4 8 0</u>	Multiplication by 60
3 0 6 8 6	

$458 \times 67 = 30686$

(ii)

3 7 0 9	
<u>× 8 9</u>	
3 3 3 8 1	Multiplication by 9
<u>2 9 6 7 2 0</u>	Multiplication by 80
3 3 0 1 0 1	

$3709 \times 89 = 330101$

(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

$$= 75 \times 98$$

$$= 75 \times (100 - 2) \quad \text{(Using distributive law)}$$

$$= 75 \times 100 - 75 \times 2$$

$$= 7500 - 150$$

$$= 7350 \text{ km}$$

\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

$$= 24350 \times (140 - 1)$$

(Using distributive property)

$$= 24350 \times 140 - 24350$$

$$= 3409000 - 24350$$

$$= \text{Rs. } 3384650$$

\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]

$$= 90000000 - 1350000$$

$$= 88650000$$

\therefore 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

\therefore 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

\therefore 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 = $36 \times 53 + 28$

$$= 1936$$

= 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 = $47 \times 423 + 0$

$$= 19881$$

= 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

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

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

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

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

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

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

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

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

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

Dividend = divisor \times quotient + remainder

$$= 46 \times 11 + 15$$

$$= 506 + 15$$

$$= 521$$

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

$$(888 + 777 + 555) = (111 \times ?)$$

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

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.