8) False.

$\frac{4}{2} = 2$ (whole number)

$\frac{2}{4} = \frac{1}{2}$ (Not a whole number)

Thus, division of whole numbers is not closed.

9) False.

1 is the multiplicative identity of whole numbers.

10) True

$8 \times 62 + 8 \times 34 + 8 \times 4 = 8 \times (62 + 34 + 4)$

This shows distributive property of multiplication over addition.

## Mental Maths

1) True

2) False.

The smallest natural number is 1.

3) True.

Whole numbers are infinite.

4) False.

There are 101 whole numbers upto 100.

For example: 0, 1, 2, 3, 4 - - - - 98, 99, 100.

5) True

6) False.

0 is the smallest whole number. It does not have any predecessor. 1 is the successor of 0.

7) True

$$(2+3)+4 = 2+(3+4)$$
$$5+4 = 2+7$$
$$9 = 9$$

Thus, addition of whole numbers is associative.

(a) Mr. Yusuf is a kind person. He believes in charity for good cause and child development.

2)

(a) Total number of roses used in 7 bouquets

$= 8 \times 7 = 56$

Total number of marigolas used in 7 bouquets

$= 6 \times 7 = 42$

(b) Total number of flowers = Total number of roses + Total number of marigolds.

$= 56 + 42 = 98$

Thus. $56 + 42 = 98$

Sum of two whole numbers is also a whole number.

Thus whole numbers are closed under addition.

(c) Richa is very hard working. She would have to be willing to do the work and earn some money to meet her family expenditures. She loves her father and family.

9. (b)

Suppose 'a' is a non-zero whole number.

Thus $\frac{a}{a} = 1$

10) (b)

Given pattern consists with two series.

1, 3, 5, 7 - - -

4, 6, 8 - - -

Thus - 1, 4, 3, 6, 5, 8, 7, 10

## Value Based Questions.

1)

(a) Total cost of English Books = ₹ 52 × 42
= ₹ 2,184

(b) Total cost of Maths Books = ₹ 40 × 39
= ₹ 1,560

(c) Total amount spent by Mr. Yusuf
= ₹ 2,184 + ₹ 1,560
= ₹ 3,744

7) (d)

Multiplication of whole numbers is closed

$$4 \times 5 = 20$$

The product of two numbers are always whole number.

Multiplication of whole numbers is commutation.

$$4 \times 3 = 3 \times 4$$
$$12 = 12$$

Multiplication of whole number is associative.

$$(2 \times 5) \times 6 = 2 \times (5 \times 6)$$
$$10 \times 6 = 2 \times 30$$
$$60 = 60$$

(8) (c)

$$\boxed{a \times 1 = a}$$

Any number multiplied by 1, the we get the product is the number itself.

4) (b)

$$(8+10)+12 = 8+(10+12)$$

$$18+12 = 8+22$$

$$30 = 30$$

Thus, The above statement shows that addition of whole number is associative.

5) (a)

Subtraction of whole number is not closed

$4-2=2$ (whole number)

$2-4=-2$ (which is not a whole number)

Subtraction of whole number is not commutative

$$10-5 \neq 5-10$$

Subtraction of whole number is not associative

$$(7-2)-3 \neq 7-(2-3)$$

$$5-3 \neq 7-1$$

$$2 \neq 6$$

6) (b)

When, any number multiplied by 1, the Product is the number itself.

## Multiple choice questions: Pg 48

1) (c)

There are 81 whole numbers upto 80.

0, 1, 2, ..... 80.

2) (b)

Smallest natural number is 1, whose predecessor does not exist.

3) (d)

Addition of whole number is closed.

$3+4=7$

Sum of two whole number is also a whole number.

Addition of whole number is associative.

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

$5+4 = 2+7$

$9 = 9$

Addition of whole number is commutative.

$3+4=4+3$

$7=7$

3)

(i) In the first row, middle number is 3.

Thus. $3 \times 5 = 15$

In the second row, middle number is 4.

Thus, $4 \times 5 = 20$

In the third row, middle number is 5.

Thus, $5 \times 5 = 25$

Hence. the required number is 5.

(ii)

Required row = $13 + 14 + 15 + 16 + 17 = 75$

(iii) No.

4) Next figure made up of 6 sides and 6 vertices

5) Here is the collection of all letters of English alphabet made up of line segments only.

Thus, 2, 5, 3, 10, 4, 15, 5, 20, 6, .

2)

(i) $111 \div 3 = 37$

$222 \div 6 = 37$

$333 \div 9 = 37$

$444 \div 12 = 37$

$555 \div 15 = 37$

$666 \div 18 = 37$

$777 \div 21 = 37$

Dividend is a triplet of consecutive natural numbers.

Divisor is a multiple of 3.

(ii) $9 \times 9 + 7 = 88$

$98 \times 9 + 6 = 888$

$987 \times 9 + 5 = 8888$

$9876 \times 9 + 4 = 88884$

$98765 \times 9 + 3 = 888885$

$987654 \times 9 + 2 = 8888886$

$9876543 \times 9 + 1 = 88888887$

# Exercise 2.3

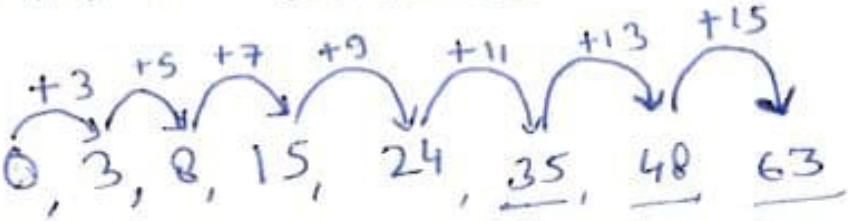
1)

(i) This pattern follows square of natural number.

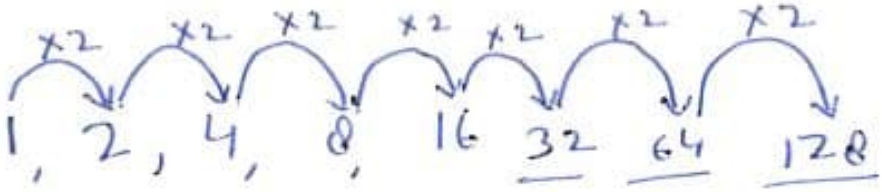
$(1)^2, (2)^2, (3)^2, (4)^2, (5)^2, (6)^2, (7)^2, 8^2$

1, 4, 9, 16, 25, 36, 49, 64

(ii)




(iii)




(iv) (First number, second number) Here, First number is the series of whole numbers
Here, second number is the twice of first number)

Thus

(0, 0), (1, 2), (2, 4), (3, 6), (4, 8), (5, 10), (6, 12)

(v) Next number is the sum of two previous number

1, 1, 2, 3, 5, 8, 13, 21, 34

(vi) There are two different series in one pattern.

2, 3, 4, . . .

5, 10, 15, . . .

(vi) $(1575 \div 1575) - (1575 \div 1575)$

$= 1 - 1$ [operating bracket]

$= 0$ [operating '-']

(vii) $492 \times 16 + 492 \times 4$

$= 492 \times (16 + 4)$ (Distributive property of multiplication over addition)

$= 492 \times 20$

$= 9,840$

10.

**Match the following :**

(a) $3 + 0 = 3$

(b) $5 + (4 + 16) = (5 + 4) + 16$

(c) $28 \times (251 - 151) = 28 \times 251 - 28 \times 151$

(d) $738 \times 1 = 738$

(e) $83 \times 21 = 21 \times 83$

(i) **Distributive property of multiplication over subtraction**

(ii) **Associative property of addition**

(iii) **Commutative property of multiplication**

(iv) **Identity of addition**

(v) **Identity of multiplication**

(a) → (iv) ; (b) → (ii) ; (c) → (i) ; (d) → (v) ; (e) → (iii)

9)

(i) $65,008 \div 1$

$= \frac{65008}{1} = 65008$

(ii) $0 \div 875$

$= 0$ [Since $\because 0 \div a = 0$]

where a is Non-zero number

(iii) $985 + (5610 \div 10)$

$= 985 + 561$ [operating 'D']

$= 1546$ [operating 'A']

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

$= 1507 - 25$ [operating 'D']

$= 1482$ [operating 'S']

(v) $32,277 \div (48 - 39)$

$= 32,277 \div 609$ [operating 'S']

$= 53$ [operating 'D']

(iv) False.

Addition of whole number is commutative

$3+4 = 4+3$

but Subtraction of whole number is not commutative.

$4-3 \neq 3-4$

(v) False.

Any number divided by zero is not possible.

(vi) True

Any number multiplied by zero is always equal to zero.

8) Fill in the blanks:

(i) $225 \times 0 = \underline{0}$

(ii) $1560 \times 15 = 15 \times \underline{1560}$

(iii) $1 \times 9999 = \underline{9999}$

(iv) $\underline{6365} - 0 = 6365$

(v) $\underline{2799} - 1 = 2799$

(2) 2|20

(iii)

$402 \times 279$

$= (400 + 2) \times 279$

$= 400 \times 279 + 2 \times 279$

$= 111,600 + 558$

$= 112,158$

7)

(i) True

For example: $1 \div 1 = 1$

(ii) False

$$4\overline{)21}\,(5$$
$$\underline{20}$$
$$1$$

Here, $1 < 4$, which is not equal to divisor.

(iii) False

Smallest 4-digit number = 1000

Greatest 3-digit number = 999

Thus $1000 > 999$.

(v) $99 \times 38$

$= (100-1) \times 38$

$= 100 \times 38 - 1 \times 38$ ← (Distributive property of multiplication over subtraction)

$= 3800 - 38$

$= 3762$

6)

(i) $953 \times 997$

$= 953 \times (1000 - 3)$

$= 953 \times 1000 - 953 \times 3$

$= 953000 - 2859$

$= 950141$

(ii) $384 \times 104$

$= 384 \times (100 + 4)$

$= 384 \times 100 + 384 \times 4$

$= 38400 + 1536$

$= 39936$

(ii) $8 \times 354 \times 125 \times 5$

By suitable arrangements, we get

$= 354 \times 8 \times 125 \times 5$ (Commutative property of multiplication)

$= 354 \times 1000 \times 5$

$= 354 \times 5000$

$= 1770000$ (Closure property of multiplication)

(iii) $61 + 73 + 39 + 57$

By suitable rearrangements, we get:

$= 61 + 39 + 73 + 57$ (commutative property of addition)

$= 100 + 130$

$= 230$ (Closure property of addition)

(iv) $202 \times 64$

$= (200 + 2) \times 64$ (~~use~~ Distributive property over addition)

$= 200 \times 64 + 2 \times 64$

$= 12800 + 128$

$= 12,928$

and $20 \div 100 = \frac{20}{100} = \frac{1}{5}$

so $100 \div 20 \neq 20 \div 100$

Thus we say that division is not commutative under whole numbers.

(viii) Product of two numbers is a whole number.

Here, we take one ~~exp~~ example.

$5 \times 6 = 30$

Here, 5 and 6 is a whole number. 30 is also a whole number.

Thus, it shows closure property of multiplicati over whole numbers.

5)

(i) $235 + 900 + 365$

By suitable arrangements, we get:

$= 235 + 365 + 900$ (commutative property of addition)

$= 600 + 900$

$= 1500$ (closure property of addition)

(ii) $32 \times 457 - 32 \times 257 = 32 \times (457 - 257)$

Here, it shows property of distributivity:

Distributivity of multiplication over subtraction in whole numbers.

(iii) $(15 \times 18) \times 5 = 15 \times (18 \times 5)$

Here, it shows property of associativity:

Associativity of multiplication in whole numbers.

(iv) $35 + 43 = 43 + 53$

Here, it shows property of commutativity:

Commutativity of addition of whole numbers.

(v) $8 + 0 = 8$

Here it shows additive identity in whole numbers

(vi) $3 \times 1 = 3$

Here it shows multiplicative identity in natural/whole numbers.

(vii) $100 \div 20 \neq 20 \div 100$

we find that

$$100 \div 20 = \frac{100}{20} = 5$$

(ii) $987 \times 39 + 13 \times 39$

$= 39 \times 987 + 39 \times 13$ (Rearrange)

$= 39 \times (987 + 13)$ [using distributive proper of multiplication ove addition]

$= 39 \times 1000$

$= 39000$

41

(i) We find that

$20 - (8 - 4) = 20 - 4 = 16$

and $(20 - 8) - 4 = 12 - 4 = 8$

So $20 - (8 - 4) \neq (20 - 8) - 4$

Thus, we say that subtraction is not associative over whole numbers.

# Exercise 2.2

1) $728 \times 435$

$= 728 \times (400 + 30 + 5)$

$= (728 \times 400) + (728 \times 30) + (728 \times 5)$

$= 291200 + 21840 + 3640$

$= 316680$

2) 0 is the required whole number.

(i) $P + P = P$

Put $P = 0$

$0 + 0 = 0$

(ii) $P - P = P$

Put $P = 0$

$0 - 0 = 0$

(iii) $P \times P = P$

Put $P = 0$

$0 \times 0 = 0$

(iv) $P \div P = P$

$0 \div 0 = 0$

3)

(i) $352 \times 18 + 352 \times 82$

$= 352 \times (18 + 82)$ [Using distributive property of multiplication over addition]

$= 352 \times 100$

$= 35200$

8)

(i)

Here, Forty lakh, one hundred and five < 24 million

Thus,

Forty lakh, one hundred and five lies on the left on the number line.

(ii)

Here . 35 millions < 10 crores

Thus, 35 millions lies on the left on the number line.

(iii) Here

6,44,321 < 24,83,040

Thus, 6,44,321 lies on the left on the number line.

(viii) $4 \times 5$

Since multiplication is the process of repeated addition, for computing $4 \times 5$, we had to add 4 to itself 5 times.

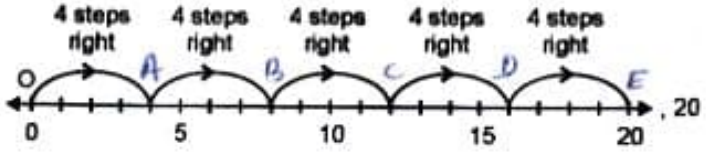
ie. $4 \times 5 = 4+4+4+4+4$

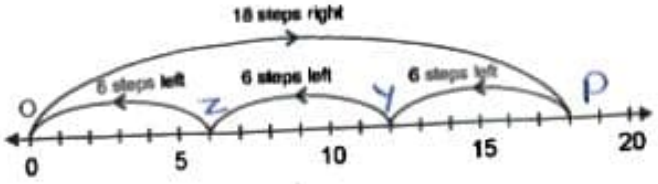
- Now draw a number line.
- From O, move 4 steps to right to reach A.
- From A move 4 steps to right to reach B.
- From B, move 4 steps to right to reach C.
- From C, move 4 steps to right to reach D.
- From D, move 5 steps to right to reach E.

Finally, we reach the point E showing that

$4 \times 5 = 4+4+4+4+4 = 20$

Thus, $4 \times 5 = 20$






Step 3: Subtract 6 from 18 repeatedly till we reach a number less than 6, so that subtracting 6 from it is not possible further.

After first subtraction, we reach point Y representing 12.

After second subtraction, we reach point Z representing 6.

After third subtraction, we reach point O representing 0.

Thus, after 3 steps of subtraction, we reach the number 0 which is less than 6 (the divisor).

It means that we are able to subtract 6 from 18 maximum 3 times, leaving a remainder 0.

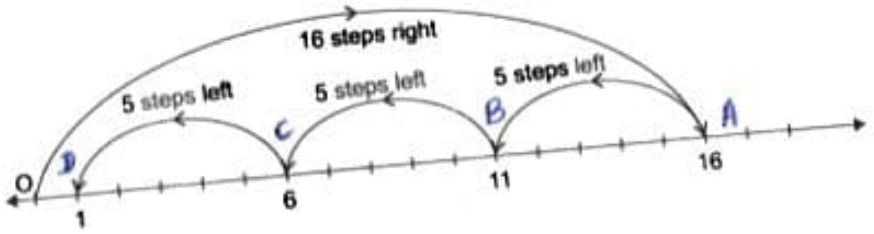
∴ $18 \div 6$ gives 3 as the quotient and 0 is the remainder.

Step 4: Moving 5 steps left from B, we reach pain C, which corresponds to number 6.

Step 5: Moving 5 steps left from C, we reach Point D, which corresponds to number 1.

As $1 < 5$, further moving 5 steps left is not possible.

(vi)




Here the subtraction has been done 3 times.
Thus, Quotient = 3.
Finally, when we reach the point D, it was not possible to further subtract 5.
D corresponds to number 1 Hence, Remainder = 1

$\therefore$ $16 \div 5$ gives Quotient = 3 and Remainder = 1

(vii) $18 \div 6$

Step 1: Let us draw the number line first.

Step 2: Move 18 steps towards right from O and reach P.

(v) $5 \times 3$

Since multiplication is the process of repeated addition, for computing $5 \times 3$, we had to add 5 to itself 3 times

ie. $5 \times 3 = 5 + 5 + 5$

- Now draw a number line.

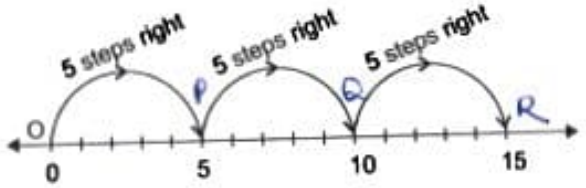
- From O, move 5 steps to right to reach P.
- From P, move 5 steps to right to reach Q.
- From Q, move 5 steps to right to reach R,

Finally, we reach the point R showing that

$5 \times 3 = 5 + 5 + 5 = 15$

Thus $5 \times 3 = 15$

(v)



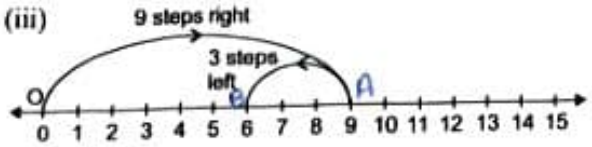

(vi) $16 \div 5$

Step1: Draw the number line.

Step2: Move from O to A, 16 steps towards right.

Step3: Moving 5 steps left from A to B, we reach point B, which corresponds to number 11

(iii)




Finally, we reach at B representing 6.

Thus, we get $9-3=6$

(iv) $7-0$

Step 1: Draw a number line with 0 as starting point.

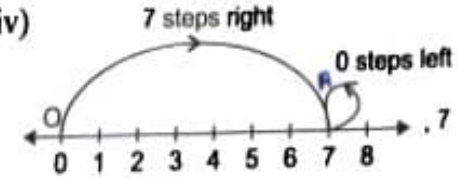
Step 2: Start from 0 and move 7 steps right reaching point A, which represents the number 7.

Step 3: Start from A and move 0 steps towards left reaching A again.

Step 4: The final point A represents the number 7 which is the answer for $7-0$.

Thus, $7-0=7$

(iv)



Points on this line at equal intervals of one unit each, marked with numbers 1, 2, 3, 4, ....

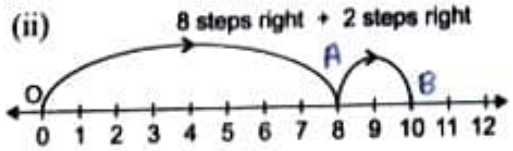
Step 2: Starting from O move 8 steps right from O, to reach A.

Step 3: Starting from A, move 2 more steps towards right, reaching B.

The point A and B correspond to the whole numbers 8 and 2

Thus, $8 + 2 = 10$

~~(iii)~~




(iii) $9 - 3 = 6$

Step 1:
Draw a number line and let the point O represent the number 0.

Step 2: Starting from O, move 9 steps towards right reaching A. A represents number 9.

Step 3: Start from A and move 3 steps toward left reaching point B, which represents number 3

7)

(i) 5+4

Step-1

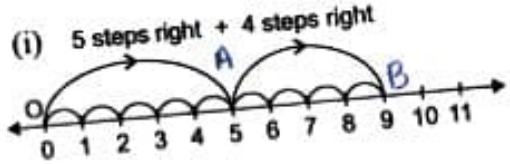
Draw a number line marked with starting point O showing the number 0. Take points on this line at equal intervals of one unit each, marked with numbers 1, 2, 3, 4, ...

Step2: Starting from O move 5 steps right of O, to reach A.

Step 3: Starting from A, move 4 more steps towards right, reaching B.

The point A and B correspond to the whole numbers 5 and 4.

Thus 5+4 = 9




(ii) 8+2

Step 1: Draw a number line marked with starting point O showing the number 0. Take

(ii) True

Explanation:

Natural numbers are infinite. They are countless.

(iii) True

Explanation:

For getting the successor of any whole number, we add 1.

(iv) False.

Explanation:

We cannot find the preaecessor of 0.

(v) True

(v) True

6) Fill in the blanks:

(i) Division means repeated Subtraction

(ii) Multiplication means repeated addition.

(iii) Any number × 0 = 0

(iv) Any number - 0 = Number itself

# Whole numbers

## Exercise 2.1

1) Natural numbers are counting numbers which are infinite.

The natural number together with 0 are called whole numbers.

Thus, there are infinite whole numbers which are natural numbers.

1, 2, 3, 4 . . . .

2) 0 is the only whole number which is not natural.

3) Yes, 0 is the whole number which when added to itself gives the same number.

$$0 + 0 = 0$$

4) The number 0 does not have any predecessor

5)
(i) False
Explanation: 0 is the smallest whole number.

6)

Smallest 6-digit number = 100000

largest 2-digit number = 99

$$
\begin{array}{r|l}
99 & 1000000 \\
-99 & \\
\hline
100 & \\
-99 & \\
\hline
10 & 1010
\end{array}
$$

Here, Quotient = 1010

Remainder = 10.

# Chapter-2 Whole Numbers

## What we have learnt

1) There are 51 whole numbers up to 50.

0, 1, 2, 3, ..... 49, 50.

2) The smallest whole number is 0 (zero).

3)

(a)
$$\begin{array}{r} 57394 \\ 2014 \\ +\ 189 \\ \hline 59,597 \end{array}$$

(b)
$$\begin{array}{r} 41932 \\ 1943 \\ +\ 2008 \\ \hline 45,883 \end{array}$$

4)

(a)
$$\begin{array}{r} 80196 \\ -\ 47568 \\ \hline 32628 \end{array}$$

(b)
$$\begin{array}{r} 60007 \\ -\ 25391 \\ \hline 34,616 \end{array}$$

5) (a)
$$\begin{array}{r} 4319 \\ \times\ 24 \\ \hline 17276 \\ 8638\ \times \\ \hline 1,03,656 \end{array}$$

(b)
$$\begin{array}{r} 6304 \\ \times 123 \\ \hline 18912 \\ 12608\ \times \\ 6304\ \times\ \times \\ \hline 7,75,392 \end{array}$$