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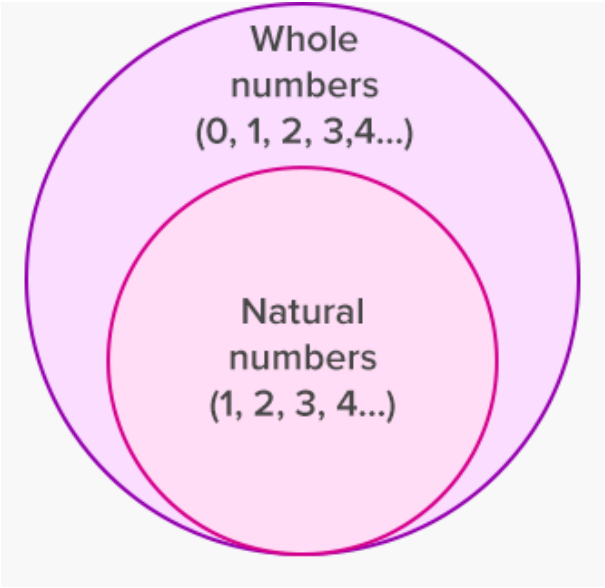
NATURAL NUMBERS AND WHOLE NUMBERS

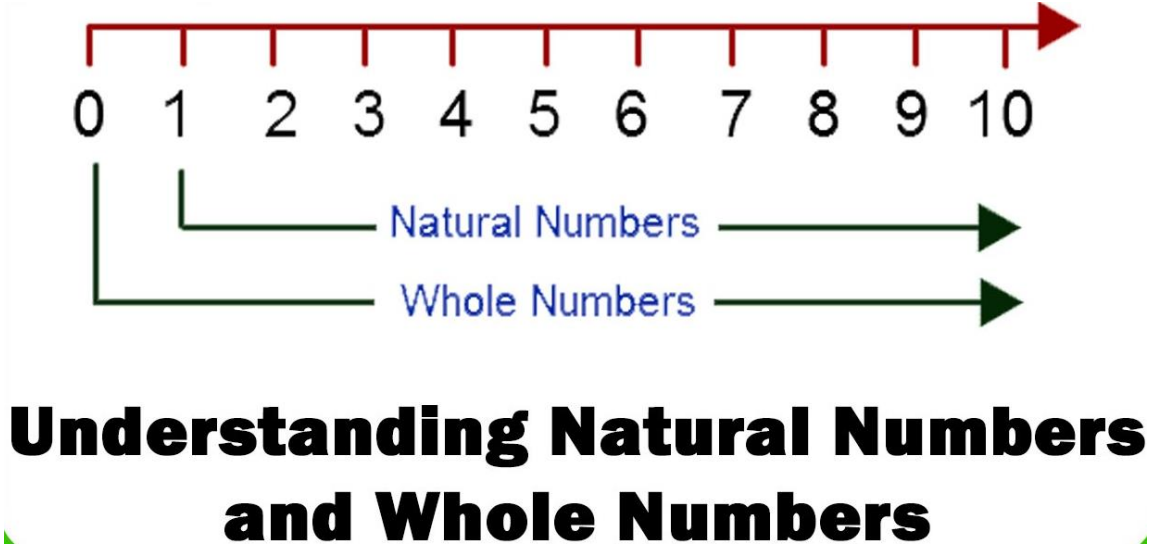
SUBJECT : MATHEMATICS
CHAPTER NUMBER: 05
CHAPTER NAME : NATURAL NUMBERS AND WHOLE NUMBERS
SUB TOPIC: Natural Number System and Whole Number System
PERIOD NO:1

Learning outcomes

- Students will be able to define and differentiate natural number and whole numbers.
- Students will be able to apply properties of Natural numbers.
- Students will be able to apply properties of Whole numbers.

Natural Numbers and Whole Numbers





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Natural Numbers and Whole Numbers

Natural numbers and whole numbers will be explained using a video.
https://www.youtube.com/watch?v=-L94qb6RXwc(4.49)

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Properties of Addition of Natural Numbers and Whole Numbers

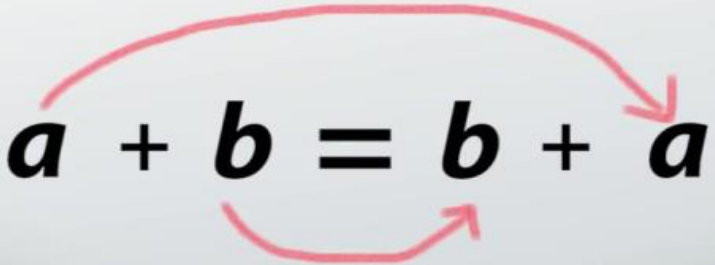
Properties of addition of whole numbers will be explained with the help of a video
https://www.youtube.com/watch?v=m0YAJe_NDeM

Properties of Addition in N

Closure Property

If $a, b \in N$, then $(a + b) \in N$. We say that N is closed under addition.

Formula for the commutative property of addition is



PROPERTIES OF ADDITION

- Commutative property of addition:
  - Numbers can be added in any order
  - Example: 2 + 4 + 3 = 3 + 4 + 2
- Associative property of addition:
  - Numbers can be grouped in any way and the sum is the same
  - Example: (2 + 4) + 3 = 2 + (4 + 3)

Identities

Of Addition/Subtraction

$a + 0 = a$ $\qquad$ $a - 0 = a$

0 is the additive identity

Of Multiplication/Division

$a \cdot 1 = a$ $\qquad$ $a \div 1 = a$

1 is the multiplicative identity

Properties

The additive inverse property tells us to simply take a number and add its opposite so we get zero.

Example 1 $6 + (-6) = 0$

-6 is the additive inverse of 6.

Evaluation Question

1. Fill in the blanks :

(i) Smallest natural number is ……..

(ii) Smallest whole number is ……

(iii) Largest natural number is ……

(iv) Largest whole number is ……..

(v) All natural numbers are ……

Solution:

(i) Smallest natural number is 1

(ii) Smallest whole number is 0

(iii) Largest natural number is not possible

(iv) Largest whole number is not possible

(v) All natural numbers are whole numbers

Evaluation Question

4. Fill in the blanks :

(i) 54 + 234 = 234 + ……

(ii) 332 + 497 = …… + 332

(iii) 286 + 0 = ……..

Solution:

(i) 54 + 234 = 234 + 54

(ii) 332 + 497 = 497 + 332

(iii) 286 + 0 = 286

Evaluation Question

5. By re-arranging the given numbers, evaluate:

(i) 237 + 308 + 163

(ii) 162 + 253 +338 + 47

Solution:

(i) 237 + 308 + 163

= (237 + 163) + 308 (by associative law)

= 400 + 308

= 708

(ii) 162 + 253 + 338 + 47

= (162 + 338) + (253 + 47) (by associative law)

= 500 + 300

= 800

Evaluation Question

7. Which property of addition is satisfied by:

(i) 8 + 7 = 15

(ii) 3+ (5 + 4) = (3 + 5)+ 4

(iii) 8 x (8 + 0) = 8 x 8 + 8 x 0

(iv) (7 + 6) x 10 = 7 x 10 + 6 x 10

(v) (15 – 12) x 18 = 15 x 18 – 12 x 18

Solution:

(i) 8 + 7 = 15

The property used as closure property satisfied by 15

(ii) 3 + (5 + 4) = (3 + 5) + 4

3 + (5 + 4) = 3 + 9 = 12 and

(3 + 5) + 4 = 8 + 4 = 12

The property used as Associative law of addition satisfied by 12

Evaluation Question

(iii) 8 x (8 + 0) = 8 x 8 + 8 x 0

8 × (8 + 0) = 8 × 8= 64 and

8 × 8 + 8 × 0 = 64 + 0= 64

The property used as Distributive of multiplication over addition satisfied by 64

(iv) (7 + 6) × 10 = 7 × 10 + 6 × 10

(7 + 6) × 10 = 13 × 10= 130 and

7 × 10 + 6 × 10 = 70 + 60= 130

The property used as Distributive property over addition satisfied by 130

(v) (15 – 12) x 18 = 15 x 18 – 12 x 18

(15 – 12) × 18 = 3 × 18= 54 and

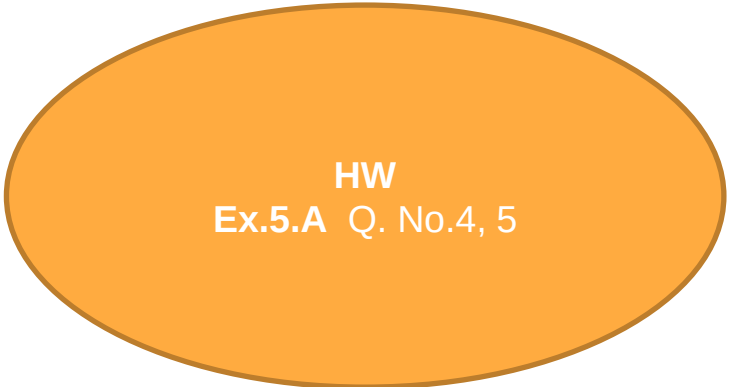
15 × 18 – 12 × 18 = 270 – 216= 54

- The property used is Distributive over subtraction satisfied by 54

Additional Homework

Q1. Starting from the least even natural number, state the sum of the first four even numbers

Q2. Subtract the successor of 99 from the predecessor of 201.



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