Addition on Number Line

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If we see various operations on numbers, we notice several properties of whole numbers. These properties help us to understand the numbers better and also make calculations under certain operations very simple.

Properties of Addition

i) Closure property:

a, b Whole Numbers \rightarrow (a + b) Whole Number

if a and b are two whole numbers, then a + b is always a whole number.

а	b	a + b
10	7	17, a whole number
5	6	11, a whole number
8	25	33, a whole number



+6

If a and b are two whole numbers, then a + b = b + a

а	b	a+b	a+b	ls a + b = b + a?
10	7	10 + 7 = 17	7 + 10 = 17	Yes
5	6	5 + 6 = 11	6 + 5 = 11	Yes
8	25	8 + 25 = 33	25 + 8 = 33	Yes

Hence, we can add two whole numbers in any order. So, the sum of whole numbers remains the same even if the order of addition is changed.

Therefore, we can say that addition is commutative for whole numbers. This property is known as commutativity for addition.

iii) Associative Property:

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If a, b and c are any three whole numbers, then

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

а	b	С	(a + b) + c	a + (b + c)	ls (a + b) + c = a + (b + c)?
10	7	5	(10 + 7) + 5 = 22	10 + (7 + 5) = 22	Yes
5	6	21	(5 + 6) + 21 = 32	5 + (6 + 21) = 32	Yes
8	25	5	(8 + 25) + 5 = 38	8 + (25 + 5) = 38	yes

When we are adding whole numbers, they can be grouped in any order and the result remains the same. Therefore, whole numbers are associative under addition. This property is known as associativity for addition.

When we are adding three or more numbers then we can group them in such a way that the calculations become easier.

Example: Find the sum of 435, 216 and 165

435+216 + 165

Now, 5+5=10. So, we add 435 + 165 first.

= (435+165) + 216

=600+216 = 816

Example: Find the sum by suitable arrangement:

a) 837 +208 +363

b) 1962 + 453 + 1538 + 647



a) Now, 7+3= 10. So, we add 837 +363 first.

= (837 + 363) + 208

= 1200+ 208 1408

b) 1962 + 453 +1538 + 647

Now, 2 + 8=10. So, we make one group of (1962+1538)

3+7=10. Next we make another group of (453 + 647)

= (1962+1538) + (453 + 647) =

3500 + 1100 = 4600