



BAL BHARATI PUBLIC SCHOOL, PITAMPURA, DELHI – 110034

SUBJECT:- MATHEMATICS

CHAPTER:-1

TOPIC:- (Integers)

Dear Students

- Integers are family of numbers containing positive, negative and zero.
- Till now in class 6th you have studied about adding and subtracting the integers on the number line, and doing them manually.
- In class 7th we will study how to multiply integers, how to divide integers and about closure, associative, commutative, distributive properties related to addition, subtraction, multiplication.
- Chapter link- <http://ncert.nic.in/textbook/textbook.htm?gemh1=1-15>

Step-1 INTRODUCTION TO INTEGERS

- We have learnt about whole numbers and integers in Class VI.
- We know that integers form a bigger collection of numbers which contain whole numbers and negative numbers.
- In this chapter, we will study more about integers, their properties and operations.
- First of all we will recall what have done in class 6th.

Integer on number line

RECALL

We know how to represent integers on a number line.

Practice Exercise 1.1 (NCERT)

Refer to page number 4 and 5 of NCERT class 7 Mathematics for practice questions

Step -2 Topic - PROPERTIES OF ADDITION AND SUBTRACTION OF INTEGERS

Subtopics

PROPERTIES OF INTEGERS Refer to the link below to understand the properties of integers with respect to different binary operation(you tube link on properties of integers)

https://www.youtube.com/watch?v=sc553_qkXSI

Step - 3 - Closure under Addition

In general, for any two integers a and b , $a + b$ is an integer. For example
(a) $227 + 24 = 251$. 251 is an integer

Step-4 - Closure under Subtraction

As (i) $7 - 9 = - 2$ Result is an integer
Thus, if a and b are two integers then $a - b$ is also an integer.

Step-5 Commutative Property

In general, for any two integers a and b , we can say
 $a + b = b + a$

*Subtraction is not commutative for whole numbers.

Step - 6 Associative Property of Addition

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

Step-6 Additive Identity

$$a + 0 = a = 0 + a$$

Step 7 Practice exercise 1.2(NCERT)

Practice the exercise on page 9 of NCERT class 7

Step 8

Refer to the link below to practice questions on properties of integer (Khan Academy questions)

<https://www.khanacademy.org/math/in-in-class-7th-math-cbse/x939d838e80cf9307:in-in-7th-integers/x939d838e80cf9307:properties-of-addition-and-subtraction-of-integers/e/closure-property-of-integers?modal=1>

Topic -Multiplication of Integers

Step 9 Subtopic-

Multiplication of a Positive and a Negative Integer

We have from the following number line, $(-5) + (-5) + (-5) = -15$

But we can also write

$$(-5) + (-5) + (-5) = 3 \times (-5)$$

Therefore, $3 \times (-5) = -15$

Step 10 Multiplication of two Negative Integers

In general, for any two positive integers a and b ,

$$(-a) \times (-b) = a \times b$$

Step 11 Product of three or more Negative Integers

Even number of negative signs shows positive result and odd number of negative signs shows negative result.

Step 12 Topic -PROPERTIES OF MULTIPLICATION OF INTEGERS

Subtopics

Step 13 - Closure under Multiplication

As $(-20) \times (-5) = 100$ Product is an integer

$a \times b$ is an integer, for all integers a and b .

Step -14 Commutativity of Multiplication

In general, for any two integers a and b ,

$$a \times b = b \times a$$

Step 15 - Multiplicative Identity

In general, $a \times 1 = 1 \times a = a$

Step 16. Associativity for Multiplication

In general $(a \times b) \times c = a \times (b \times c)$

Step 17 DISTRIBUTIVE PROPERTY OF INTEGERS

Since $(-2) \times (3 + 5) = -2 \times 8 = -16$

and $[(-2) \times 3] + [(-2) \times 5] = (-6) + (-10) = -16$

So, $(-2) \times (3 + 5) = [(-2) \times 3] + [(-2) \times 5]$

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

Step 18 Practice exercise 1.3 (NCERT) pg 21 ncert class 7th questions 1,2,3,4

Step 19 Topic - Word problems on integers

Practice the questions on page number 21 - question no 6,7,8

Step 20 - Link for practice questions on application of integers

*<https://www.khanacademy.org/math/in-in-class-7th-math-cbse/x939d838e80cf9307:in-in-7th-integers/x939d838e80cf9307:multiplication-and-division-of-integers/e/distributivity-of-multiplication-over-addition-for-integers?modal=1> (QUIZ)

SUMMARY

- Recall integers in number line, addition and subtraction
- Properties of integers- commutative, associative, distributive and significance of these properties on binary operation
- Multiplicative identity
- Questions on properties of integers
- Word problems of integers
- Application of integers in daily life

Step 21 Practice Worksheet

Q1. $[(-10) \times (+9)] + (-10)$ is equal to

(a) 100

(b) -100

(c) -80

(d) 80

Q2. When the integers 10, 0, 5, -5, -7 are arranged in descending or ascending order, then

find out which of the following integers always remains in the middle of the arrangement.

(a) 0

(b) 5

(c) -7

(d) -5

Q3. The next number in the pattern $-62, -37, -12$ _____ is

- (a) 25 (b) 13 (c) 0 (d) -13

Q4. The product of $-5 \times -6 \times (-1) \times (1)$ is

- (a) -30 (b) 30 (c) 11 (d) -11

Q5. On the following number line value 'Zero' is shown by the point



- (a) X (b) Y (c) Z (d) W

Q6. On the number line, the value of $(-3) \times 3$ lies on right hand side of

- (a) -10 (b) -4 (c) 0 (d) 9

Q7. The value of $5 \div (-1)$ does not lie between

- (a) 0 and -10 (b) 0 and 10 (c) -4 and -15 (d) -6 and 6

Q8. $(-11) \times 7$ is not equal to

- (a) $11 \times (-7)$ (b) $-(11 \times 7)$ (c) $(-11) \times (-7)$ (d) $7 \times (-11)$

Q9. $(-10) \times (-5) + (-7)$ is equal to

- (a) -57 (b) 57 (c) -43 (d) 43

Q10. Which of the following is not the additive inverse of a ?

- (a) $-(-a)$ (b) $a \times (-1)$ (c) $-a$ (d) $a \div (-1)$