1 INTEGERS

1.1 INTRODUCTION

In Class 6, you studied about integers. You learnt how to represent them on the number line and various other operations on the integers. In this chapter, you will revise those concepts.

Natural Numbers: Counting numbers 1, 2, 3, 4, ... are called natural numbers.

Whole Numbers: Natural numbers along with the number 0 (zero) are called whole numbers.

Integers: All the whole numbers along with the negative of the natural numbers are called integers.

i.e. ..... –5, –4, –3, –2, –1, 0, 1, 2, 3, 4, ... are all integers.

Note that

(i) 0 is the only whole number that is not a natural number.

(ii) 0 (*zero*) is neither a positive integer nor a negative integer.

1.2 OPERATIONS ON INTEGERS

Addition of Integers

Rule 1: ***Integers with the same sign***: Two integers with the same sign can be added by adding their numerical values (i.e., the numbers regardless of their signs) and assigning a common sign to the sum.

SOLVED EXAMPLES

Example 1: Add 29 and 33

Solution: 29 + 33 [Both have the same sign]

= 62

Example 2: Add –7 and –11

Solution: $(-7) + (-11)$ [Both the numbers have the same sign, i.e. –]

$= -(7 + 11)$ [i.e., adding the numerical values and assigning – sign to the sum]

$= -18$

Rule 2: ***Adding integers with opposite signs***: To add integers with opposite signs (i.e., one of them is +ve and the other –ve), you can subtract the numerical values of the numbers (i.e., greater numerical value – smaller numerical value) and assign the sign of the number with a greater numerical value.

SOLVED EXAMPLES

Example 3: Add –35 and +45

Solution: Both the numbers are of opposite sign.

$\therefore \quad (-35) + (+45)$

$= +(45 - 35)$ [we find the difference of the numerical values 45 – 35]

$= +10$ [$\because$ +45 has greater numerical value, hence + sign is assigned to the difference]

Example 4: Add –100 and 25

Solution: $(-100) + (25) = -75$

$= -(100 - 25) = -75$ [we find the difference of the numerical values, i.e. 100 – 25]

[$\because$ –100 has a greater numerical value, hence – sign is assigned to the difference]

Properties of Addition of Integers

(i) ***Closure property***: If a and b are two integers, then $a + b$ is also an integer.

EXAMPLES

(*i*) $7 + 3 = 10$ is an integer.

(*ii*) $-7 + 3 = -4$ is also an integer.

(*iii*) $7 - 3 = 4$ is an integer.

(*iv*) $-7 - 3 = -10$ is an integer.

(ii) ***Commutative property***: If a and b are two integers, then $a + b = b + a$.

For example: $(-19) + 4 = -(19 - 4) = -15$

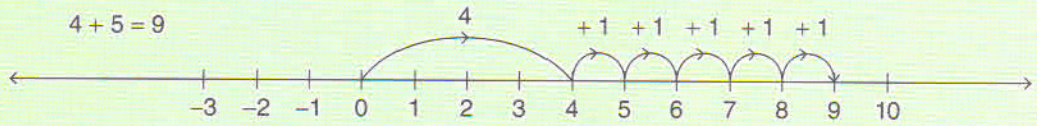
$4 + (-19) = -(19 - 4) = -15$

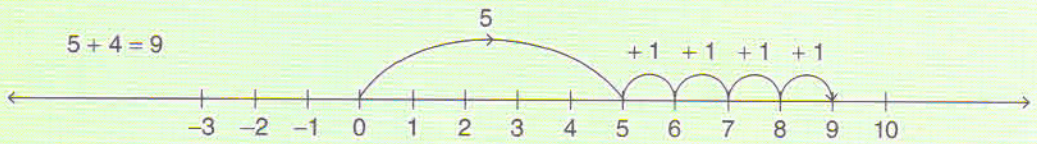
$\therefore \quad (-19) + 4 = 4 + (-19)$

SOLVED EXAMPLES

Example 5: Using a number line, show that $4 + 5 = 5 + 4$.

Solution:

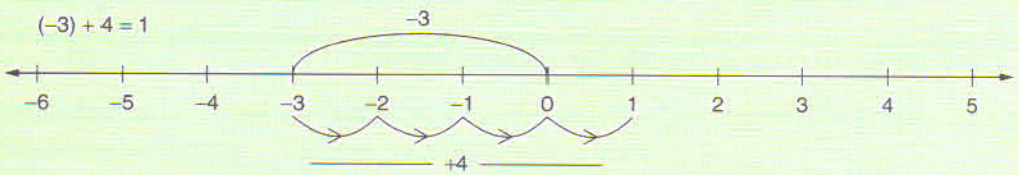


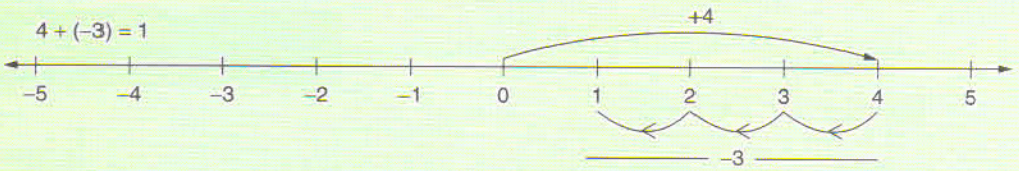


$\therefore \quad 4 + 5 = 5 + 4$

Example 6: Show on the number line that $(-3) + 4 = 4 + (-3)$.

Solution: Draw a number line as shown below.





For positive (+ve) integers, move towards the right on the number line. Hence for +4, move four units towards the right of the *initial* point.

For negative (–ve) integers, move to the left of the number line. Hence for –3, move three units to the left of the *initial* position.

(iii) ***Associative property***: If a, b and c are three integers, then $(a + b) + c = a + (b + c)$

SOLVED EXAMPLE

Example 7: Find the associative property of three integers +4, −9, −3.

Solution: +4, −9, −3

$\{(+4) + (-9)\} + (-3) = (4 - 9) + (-3)$

$= -(9 - 4) + (-3)$

$= -5 + (-3)$

$= -(5 + 3) = -8$

$(+4) + \{(-9) + (-3)\} = (+4) + \{-(9 + 3)\}$

$= (+4) + \{-12\}$

$= -(12 - 4)$

$= -8$

$\therefore \quad \{(+4) + (-9)\} + (-3) = (+4) + \{(-9) + (-3)\}$

(iv) ***Additive identity***: An integer, which when added to another integer does not change its identity (i.e., its value), is called the additive identity. For example, 0 (zero) is the additive identity of the integers because $a + 0 = 0 + a = a$, for any integer a.

Here are some examples given for additive identity

(a) $(-15) + 0 = -15$

$0 + (-15) = -15$

$\therefore (-15) + 0 = 0 + (-15)$

(b) $0 + 2 = 2 = 2 + 0$

(v) ***Additive inverse***: An integer which when added to another integer gives 0 (which is the additive identity) is called the additive inverse of that given integer.

For any integer a,

$a + (-a) = 0 = (-a) + a$

In general, –ve of an integer is its additive inverse.

SOLVED EXAMPLE

Example 8: What is the additive inverse of 7?

Solution: $7 + (-7) = 0$

$\therefore$ (-7) is the additive inverse of 7

[Also note that $(-7) + 7 = 0$, hence 7 is the additive inverse of -7]

Subtraction of Integers

If a and b are two integers, then

$a - b = a + (-b)$

$= a +$ (additive inverse of b)

$\therefore$ $5 - 7 = 5 + (-7) = -(7 - 5) = -2$

Properties of Subtraction of Integers

(i) ***Closure property***: For any two integers, a and b, $a - b$ is always an integer.

EXAMPLES

(*i*) $3 - 2 = 1$ is an integer

(*ii*) $-7 - (+2) = -9$ is an integer

(*iii*) $(+7) - (-7) = 14$ is an integer, and so on.

(ii) ***Non-commutative***: Integers are non-commutative with respect to subtraction, i.e. if a and b are two integers, then $a - b$ is not equal to $b - a$, if $a \neq b$.

EXAMPLES

(*i*) $3 - 2 = 1$ but $2 - 3 = -(3 - 2) = -1$

Hence, $3 - 2 \neq 2 - 3$

(*ii*) $(-7) - (+2) = -7 - 2 = -9$

But, $(+2) - (-7) = +2 + 7 = +9$

$\therefore$ $(-7) - (+2) \neq (+2) - (-7)$

Therefore, $a - b = b - a$, only if $a = b$

(iii) ***Non-associative***: Integers are non-associative with respect to subtraction, i.e. if a, b and c are three integers, then $(a - b) - c$ may not be equal to $a - (b - c)$.

SOLVED EXAMPLE

Example 9: Non-associative property of three integers 10, –5 and –2.

Solution:

$$\{10 - (-5)\} - (-2) = (10 + 5) - (-2)$$
$$= 15 + 2$$
$$= 17$$
$$10 - \{(-5) - (-2)\} = 10 - \{(-5 + 2)\}$$
$$= 10 - \{-(5 - 2)\}$$
$$= 10 + (5 - 2)$$
$$= 10 + 3$$
$$= 13$$
$$\therefore \quad \{10 - (-5)\} - (-2) \neq 10 - \{(-5) - (-2)\}$$

EXERCISE 1.1

Q1. Evaluate the following.

(*i*) (+7) + (+9) (*ii*) (+7) + (–9) (*iii*) (–7) + 9
(*iv*) (–7) + (–9) (*v*) 83 + (–21) (*vi*) (–79) + (–17)

Q2. Add the following using the number line.

(*i*) (–5) + (3) (*ii*) (2) + (–5) (*iii*) (–4) + (–2)

Q3. Add the following.

(*i*) –729 and 420 (*ii*) 325 and –512
(*iii*) –101 and –276 (*iv*) +215 and +103

Q4. What is the meaning of additive inverse of an integer? Find the additive inverse of the following.

(*i*) 75 (*ii*) –100 (*iii*) 42 (*iv*) 0 (*v*) –36

Q5. Find the value of the following.

(*i*) 29 – (+51) (*ii*) –72 – (–12) (*iii*) –49 – (+22)
(*iv*) 56 – (+20) (*v*) 0 – (+123) (*vi*) 0 – (–150)

Q6. Subtract the following.

(*i*) –121 from 719 (*ii*) 578 from –173
(*iii*) –887 from –188 (*iv*) 345 from 282

Q7. Taking $a = -15$ and $b = -23$, show that $a + b = b + a$ but $a - b \neq b - a$.

Q8. Find the value of the following:

(*i*) $\{(-27) + (-73)\} + (-100)$

(*ii*) $\{(-51) + (-83)\} - (-12)$

(*iii*) $\{200 - (-100)\} + (-300)$

Q9. What must be subtracted from -59 to obtain -21?

Q10. What must be added to 221 to obtain 158?

Q11. Fill in the blanks.

(*i*) $-(-73) =$ _____

(*ii*) $(-82) + (-21) = (-21) +$ _____

(*iii*) $\{(-7) +$ _____$\} + (-31) =$ (_____) $+ \{(-17) + (-31)\}$

(*iv*) _____ $- (-99) = 99$

Q12. State whether the following statements are 'True' or 'False'.

(*i*) The negative of a negative integer is always positive.

(*ii*) Any number subtracted from 0, always gives 0.

(*iii*) Commutative property of addition holds true for both addition and subtraction of integers.

(*iv*) 0 is neither a negative nor a positive integer.

(*v*) The smallest positive integer is 0.

Multiplication of Integers

Rule 1: ***Multiplying integers with the same sign***: Two integers with the same sign (i.e., either both the integers are positive or both of them are negative) can be multiplied by multiplying the numerical values of the integers (irrespective of their signs) and assigning a positive sign to the product.

Rule 2: ***Multiplying integers with opposite signs***: Two integers with opposite signs can be multiplied by multiplying the numerical values of the integers (i.e., irrespective of their signs) and assigning a minus '–' sign to the product.

EXAMPLES

(*i*) $5 \times (-3)$

$= -(5 \times 3)$ [we may skip the step]

$= -15$

(*ii*) $(-14) \times 5$

$= -(14 \times 5)$

$= -70$

(iii) $(-1) \times 20$
$= -20$

(iv) $0 \times (-30)$
$= 0$ [universal truth]

Properties of Multiplication of Integers

(i) ***Closure property***: If a and b are any two integers, then $a \times b$ is also an integer.

EXAMPLES

(i) $3 \times 5 = 15$ is an integer

(ii) $0 \times 30 = 0$ is an integer

(iii) $(-6) \times (-2) = +12$ is an integer

(iv) $(-1) \times (-1) = +1$ is an integer

(v) $(-21) \times 9 = -189$ is an integer, etc.

(ii) ***Commutative law***: For any two integers a and b, $a \times b = b \times a$.

EXAMPLES

(i) $3 \times 5 = 15 = 5 \times 3$

(ii) $(-2) \times (-10) = +20$

$(-10) \times (-2) = +20$

Hence, $(-2) \times (-10) = (-10) \times (-2)$

(iii) $(-7) \times (+4) = -28$

$(+4) \times (-7) = -28$

Hence, $(-7) \times (+4) = (+4) \times (-7)$

(iii) ***Associative law***: If a, b, c are any three integers, then $(a \times b) \times c = a \times (b \times c)$.

EXAMPLES

(*i*) For the integers (-2), 3 and (-5)

$\{(-2) \times 3\} \times (-5) = (-6) \times (-5) = +30$

$(-2) \times \{3 \times (-5)\} = (-2) \times (-15) = +30$

(*ii*) For the integers 3, -1 and 7,

$\{3 \times (-1)\} \times 7 = (-3) \times 7 = -21$

$3 \times \{(-1) \times 7\} = 3 \times (-7) = -21$

Hence, $\{3 \times (-1)\} \times 7 = 3 \times \{(-1) \times 7\}$

(iv) ***Distributive law of multiplication over addition***: For any three integers a, b and c, $a \times (b + c) = (a \times b) + (a \times c)$.

EXAMPLES

(*i*) Distributive law of multiplication over addition for the integers -2, -3 and -5.

(-2), (-3) and (-5)

$(-2) \times \{(-3) + (-5)\}$

$= (-2) \times (-8)$

$= +16$

and, $\{(-2) \times (-3)\} + \{(-2) \times (-5)\}$

$= (+6) + (+10)$

$= +(6 + 10)$

$= +16$

$\therefore \quad (-2) \times \{(-3) + (-5)\} = (-2) \times (-3) + (-2) \times (-5)$

(*ii*) Distributive law of multiplication over addition for the integers -10, 20 and -15.

$(-10) \times \{20 + (-15)\} = (-10) \times (20 - 15)$

$= (-10) \times 5$

$= -50$

and $(-10) \times 20 + (-10) \times (-15)$

$= -200 + 150$

$= -50$

$\therefore \quad (-10) \times \{20 + (-15)\} = (-10) \times 20 + (-10) \times (-15)$

(v) ***Distributive property of multiplication over subtraction:*** For any three integers a, b and c, $a \times (b - c) = (a \times b) - (a \times c)$.

EXAMPLES

(*i*) Distributive property of multiplication over subtraction for integers 1, 2 and 3.

$1 \times (2 - 3) = 1 \times (-1) = -1$

and $(1 \times 2) - (1 \times 3) = 2 - 3 = -1$

$\therefore \quad 1 \times (2 - 3) = (1 \times 2) - (1 \times 3)$

(*ii*) Distributive property of multiplication over subtraction for integers 3, (–2) and (–5).

$3 \times \{(-2) - (-5)\} = 3 \times (-2 + 5)$

$= 3 \times \{+ (5 - 2)\}$

$= +9$

and $\{3 \times (-2)\} - \{3 \times (-5)\} = (-6) - (-15)$

$= -6 + 15$

$= +9$

Hence, $3 \times \{(-2) - (-5)\} = \{3 \times (-2)\} - \{3 \times (-5)\}$

(vi) ***Multiplicative identity:*** An integer which when multiplied with another integer does not change that integer's identity (i.e., its value), is called the multiplicative identity of the integer.

For any integer a,

$(a \times 1) = (1 \times a) = a$

$\Rightarrow$ 1 is the multiplicative identity for all integers.

EXAMPLES

(*i*) $201 \times 1 = 201$

(*ii*) $(-201) \times 1 = -201$

(*iii*) $0 \times 1 = 0$, etc.

(vii) ***Multiplicative inverse:*** Multiplicative inverse exists for all integers except zero. Hence, for any non-negative integer a, if $a \times \frac{1}{a} = \frac{1}{a} \times a = 1$ (i.e., Multiplicative Identity), then $\frac{1}{a}$ is called the multiplicative inverse of a.

EXAMPLES

(*i*) $6 \times \frac{1}{6} = 1 = \frac{1}{6} \times 6$

Hence, $\frac{1}{6}$ is the multiplicative inverse of 6

(*ii*) $(-7) \times \frac{1}{-7} = 1 = 1$

$\therefore \left(\frac{1}{-7}\right)$ is the multiplicative inverse of (-7)

1.3 HOW TO MAKE CALCULATIONS EASIER

Associative or distributive properties may help us in making our calculations easier.

SOLVED EXAMPLE

Example 14: Calculate the following.

(*i*) $(-7) \times (-5) + (-7) \times 105$ (*ii*) $(-2) \times 113 \times (-5)$

(*iii*) $23196 \times (-9) - 23195 \times (-9)$

Solution:

(*i*) $(-7) \times (-5) + (-7) \times 105$

$= (-7) \times \{(-5) + 105\}$ [Using the distributive property of multiplication over addition]

$= (-7) \times 100$

$= -700$

(*ii*) $(-2) \times 113 \times (-5)$

$= 113 \times \{(-2) \times (-5)\}$ [We used the associative property of multiplication here]

$= 113 \times (+10)$

$= 1130$

(*iii*) $23196 \times (-9) - 23195 \times (-9)$ [Using the distributive property of multiplication over subtraction; $a \times c - b \times c = (a - b) \times c$]

$= (23196 - 23195) \times (-9)$

$= 1 \times (-9)$

$= -9$

Important Results

(i) Zero multiplied with any number gives zero.

(ii) If an even number of –ve integers are multiplied, then the product is a +ve integer

(iii) If an odd number of –ve integers are multiplied, then the product is also a –ve integer

EXAMPLES

(*i*) $0 \times (-20) = 0$

(*ii*) $(-3) \times (-3) \times (-3) \times (-3) \times (-3)$
$= -(3 \times 3 \times 3 \times 3 \times 3)$ [There are 5 negative integers multiplied together]
$= -243$

(*iii*) $(-2) \times (-3) \times (-5)$
$= -30$ [Three, i.e. an odd number of negative integers are being multiplied together]

(*iv*) $(-2) \times (-1) \times (-3) \times (-2)$
$= +(2 \times 1 \times 3 \times 2)$ [There are even numbers of negative integers]
$= +12$

(*v*) $(-2) \times 5 \times 3 \times (-1)$
$= +(2 \times 5 \times 3 \times 1)$ [There are even (two) numbers of negative integers]
$= +30$

(*vi*) $(-1) \times (-1) \times (-1) \times \ldots$ 5001 times
$= -1$ [$\because$ 5001 is an odd integer]

(*vii*) $(-1) \times (-1) \times (-1) \times \ldots$ 1000 times
$= +1$ [$\because$ 1000 is an even number and $1 \times 1 \times \ldots$ 1000 times $= 1$]

EXERCISE 1.2

Q1. Find the following products.

(*i*) 17×6 (*ii*) $(-11) \times 5$ (*iii*) $(-12) \times (-13)$

(*iv*) -111×0 (*v*) $4 \times 5 \times (-9)$ (*vi*) $(-4) \times 7 \times (-10)$

(*vii*) $(-2) \times (-3) \times (-5)$ (*viii*) $5 \times 7 \times (-1)$

(*ix*) $(-3) \times (-3) \times (-3) \times (-3) \ldots$ 7 times

(*x*) $(-1) \times (-1) \times \ldots$ 101 times

(*xi*) $(-1) \times (-1) \times \ldots$ 1000 times

(*xii*) $(-99) \times (-98) \times (-97) \ldots \times (-4) \times (-3) \times (-2) \times (-1) \times 0$

Q2. Simplify the following using the distributive property of multiplication.

(*i*) $(-15) \times (-3) + (-15) \times (-7)$

(*ii*) $7 \times (-11) + 7 \times (-12)$

(*iii*) $(-121) \times 999 + 21 \times 999$

(*vi*) $9999 \times 777 + 777$

(*v*) $241 \times (-540) + 241 \times 721$

Q3. Fill in the blanks.

(*i*) $12 \times (\_\_\_\_\_) = (-13) \times 12$ (*ii*) $(-52) \times 6 = 6 \times \_\_\_\_\_$

(*iii*) $(-5) \times \{(2) + \_\_\_\_\_\} = (-5) \times \_\_\_\_\_ + (-5) \times (-3)$

(*iv*) $-[-\{-(-73)\}] = \_\_\_\_\_$

(*v*) $-[-\{-(0)\}] = \_\_\_\_\_$

Q4. Write down the multiplicative inverse of the following.

(*i*) -21 (*ii*) 57 (*iii*) 1 (*iv*) 0

Q5. A person earns ₹ 125 per day and spends ₹ 31 every day. How much would he earn and spend in 30 days? What is his total savings in 30 days?

Q6. In a quiz, there are 50 questions. Each right answer carries 5 marks and the wrong answer is awarded (-2) marks. No mark is awarded for an unanswered question. If a student answers 30 questions correctly and does not attempt 5 questions, find his total score.

Division of Integers

Rule 1: ***Division of two integers with the same sign***: For two integers a and b having the same sign (i.e., either both of them positive or both negative), divide the numerical values of a and b (i.e., irrespective of their signs) and assign +ve (plus) sign to the quotient.

EXAMPLES

(*i*) $(-4) \div (-2)$

$= +(4 \div 2)$

$= +2$

(*ii*) $12 \div 3$

$= 4$

(*iii*) $(-5) \div (-1) = \left(\frac{\neq 5}{\neq 1}\right)$

$= \left(\frac{5}{1}\right) = 5$

Rule 2: ***Division of two integers with opposite signs***: For two integers a and b having opposite signs (i.e., one positive and the other negative), divide the numerical values of a and b (irrespective of their signs) and assign a minus (–ve sign) to the quotient.

EXAMPLES

(*i*) $(-4) \div 2 = -(4 \div 2) = -2$

(*ii*) $(-12) \div (-4) = -(12 \div 4) = -3$

(*iii*) $(-14) \div 7 = -(14 \div 7) = -2$

Properties of Division

(i) For any integer a, $a \div 0$ is meaningless and $0 \div a = 0$.

EXAMPLES

(*i*) $5 \div 0$ or $\frac{5}{0}$ is meaningless

(*ii*) $0 \div 5 = 0$

(*iii*) $0 \div$ (any non-zero integer) $= 0$

(ii) For any integer a, $a \div 1 = a$.

(iii) Integers are not closed with respect to division, i.e. for any two integers a and b, $a \div b$ is not necessarily an integer.

EXAMPLES

(*i*) $15 \div 12$

$= \frac{\cancel{15}^{5}}{\cancel{12}^{4}} = \frac{5}{4}$, which is not an integer

(*ii*) $(-21) \div (-9)$

$= +\left(\frac{\cancel{21}^{7}}{\cancel{9}_{3}}\right) = +\frac{7}{3}$, which is not an integer

(iv) Integers are **non-commutative** (in general) with respect to division. If a and b are two different integers, then $a \div b \neq b \div a$

EXAMPLES

(*i*) $4 \div 2 = 2$

but $2 \div 4 = \frac{1}{2}$

that is, $4 \div 2 \neq 2 \div 4$ [*Note*: $2 \div 4$ is not an integer]

(*ii*) $4 \div 0 =$ meaningless

but $0 \div 4 = 0$

$\therefore \quad 4 \div 0 \neq 0 \div 4$

(iv) Associative property also does not hold good for integers with respect to division (in general).

$\therefore \quad (a \div b) \div c \neq a \div (b \div c)$, if c is not equal to 1.

EXAMPLE

(*i*) When $c \neq 1$

Let $a = 27, b = 9$ and $c = 3$

$\therefore \quad (a \div b) \div c = (27 \div 9) \div 3$

$= 3 \div 3$

$= 1$

And $a \div (b \div c) = 27 \div (9 \div 3)$

$= 27 \div 3$

$= 9$

Hence, $(a \div b) \div c \neq a \div (b \div c)$

When $c = 1$

If $a = 27, b = 9$ and $c = 1$

$(a \div b) \div c = (27 \div 9) \div 1$

$= 3 \div 1$

$= 3$

$a \div (b \div c) = 27 \div (9 \div 1)$

$= 27 \div 9$

$= 3$

$\therefore (a \div b) \div c = a \div (b \div c)$, if and only if $c = 1$

EXERCISE 1.3

Q1. Divide the following.

(*i*) −54 by 9 (*ii*) 96 by −8 (*iii*) −78 by −13

(*iv*) −210 by −15 (*v*) 156 by (−12) (*vi*) (−7) by (−7)

Q2. What is the difference between $0 \div 49$ and $49 \div 0$? Explain.

Q3. Fill in the blanks with >, = or < sign.

(*i*) $-855 \div 19$ _____ $903 \div (-21)$

(*ii*) $(-21499) \div (-3692)$ _____ $(-98919) \div 45$

(*iii*) $0 \div (-241)$ _____ $0 \div (-240)$

(*vi*) $(-243) \div (-81)$ _____ $(-285) \div (-95)$

Q4. State whether the following statements are 'True' or 'False'.

(*i*) Integers do not follow closure property with respect to division.

(*ii*) $0 \div 5$ is the same as $5 \div 0$

(*iii*) Any integer can be divided by 0.

(*iv*) Any integer divided by 1 gives the same integer.

THINGS TO REMEMBER

1. The numbers 1, 2, 3, 4 ... are positive integers and −1, −2, −3, −4 ... are negative integers.
2. 0 is neither a positive integer nor a negative integer.
3. Positive integers are greater than negative integers.
4. The additive inverse of an integer is its negative.

HOLY TRINITY INTERNATIONAL SCHOOL

Mathematics

Grade: VII

Lesson 1 – INTEGERS **25.04.2020**

I. Choose the best answer

1. 29+33
   a)62 b)26 c)206 d)126
2. (-7) + (-11)
   a)-18 b)-81 c)-108 d)-188
3. (-35) +(45)
   a)11 b)2 c)10 d)99
4. (-100)+(25)
   a)-75 b)-70 c)170 d)-25
5. 7+3
   a)11 b)2 c)10 d)99
6. -7+3
   a)-4 b)2 c)3 d)1
7. (-1)x(-1)
   a)1 b)-1 c)2 d)-2
8. (-21) x 9
   a)-189 b)189 c)981 d)998
9. 201x1
   a)201 b)401 c)102 d)902
10. 0x1
    a)0 b)1 c)11 d)9

II. Fill in the blanks

1. –(-73)=_____.
2. (-82)+(-21)=(-21)+_____.
3. {(-7)+_____} + (-31) = (_____) + {(-17)+(-31)}.
4. _____-(-99) = 99.
5. 12x(___)=(-13) x 12.
6. (-52)x6=6x_____.
7. (-5)x{(2)+____} = (-5)x _____+(-5) x (-3).
8. –[-{-(-73)}]=_____.
9. –[-{-(0)}]=_____.
10. 12/3=_____.

III. State whether the given statements are correct or incorrect.

1. 0 is the only whole number that is not a natural number.
2. 0 is neither a positive integer nor a negative integer.
3. Counting numbers are called natural numbers.
4. Natural numbers along with the number 0 is called whole numbers.

5. All the whole numbers along with the negative of the natural numbers are called Integers.
6. If a and b are integers, then a + b is also an integer.
7. If a and b are integers, then a + b = b + a
8. Additive inverse is 1.
9. ax(b+c)= abc
10. 3x7x8=378

IV. Match the following

1.	1+0	-	-1
2.	5+6	-	0+1
3.	6+7+1	-	6+5
4.	0x3	-	14
5.	3/3	-	0
6.	2x3	-	1
7.	-54/9	-	6
8.	2X100	-	-6
9.	0/5 #	-	200
10.	3-4	-	5/0

V. Answer the following

1. What is the additive inverse of 7?
2. Evaluate the following: (+7) + (+9).
3. Evaluate the following: (-79) + (-17).
4. Add (-5) + (3).
5. Add the following: -729 and 420.
6. Add the following: -101and -276.
7. What is the meaning of additive inverse of an integer?
8. Add the following using the number line (-4) + (-2).
9. Add the following using the number line (-5) + (3).
10. Find the additive inverse of -100.

VI. Answer the following

1. Using a number line, show that 4+ 5 =5 + 4.
2. Show on the number line that (-3) +4= 4 + (-3).
3. Find the associative property of three integers 4, -9, -3.
4. Find the value of the following -72-(-12).
5. Find the value of the following 0-(-150).
6. Subtract the following -121 from 719.
7. Subtract the following 345 from 282.
8. Find the value of the following{(-27)+(-73)}+(-100).
9. Find the value of the following{(-51)+(-83)}-(-12).
10. Find the value of the following{200-(-100)}+(-300).

VII. Answer the following

1. What is the difference between 0÷ 49 and 49 ÷ 0? Explain.

2. A person earns Rs. 125 per day and spends Rs.31 every day. How much would he earn and spend in 30 days? What is his total savings in 30 days?

3. In a quiz, there are 50 questions. Each carries 5 marks and the wrong answer is awarded -2 marks. No mark is awarded for an unanswered question. If a student answers 30 questions correctly and does not attempt 5 questions, find his total score.

4. Calculate the following (-7) x (-5) + (-7) x (105).

5. Calculate the following (-2) x 113 x (-5).

6. Calculate the following 23196 x (-9) + (-23195) x (-9).

7. What must be added to 221 to obtain 158?

8. What must be subtracted from -59 to obtain -21?

9. Taking a=-15 and b=-23, show that a+b = b+a but a-b # b-a.

10. Find the non-associative property of three integers 10, -5 and -2.