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Class VII

Based on Latest NCERT Textbook

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Syllabus

No.	Chapter/Unit	Objectives
1.	Integers	To learn properties of integers (through patterns); Solve word problems of integers (all operations).
2.	Fractions and Decimals	Understand operations on rational numbers; rational number as a decimal and word problems involving mixed fractions.
3.	Data Handling	Calculate mean, median and mode, use of bar graphs.
4.	Simple Equations	Understand simple linear equations in one variable (in contextual problems) with two operations.
5.	Lines and Angles	Understand pairs of angles; Properties of parallel lines.
6.	Triangle and its Properties	Learn the different angle sum properties of triangles.
7.	Comparing Quantities	Learn to understand and calculate interest, increase or decrease as percent, profit or loss as percent.
8.	Rational Numbers	Understand operations on rational numbers and word problems of rational numbers.
9.	Perimeter and Area	Understand and calculate the perimeter and area of different figures using basic units.
10.	Algebraic Expressions	Learn to generate algebraic expressions (simple) involving one or two variables.
11.	Exponents and Powers	Understand the Laws of exponents; express numbers in exponential form.
12.	Symmetry	Learn reflection and rotation symmetry of simple figures.
13.	Visualising Solid Shapes	Understand the concept of faces, edges and vertices of different solid shapes.

Contents

CHAPTER

1

Integers

Properties of Integers under Addition

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

For example : $(-2) + (-5) = -7$ which is an integer.

(ii) Commutative property : For any two integers a and b

$$a + b = b + a$$

For example : $5 + (-4) = 1$ and $(-4) + 5 = 1$

$\therefore$ $5 + (-4) = (-4) + 5$

(iii) Associative property : For any three integers a, b, c

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

For example : $[-6 + 7] + 3 = 1 + 3 = 4$

and $-6 + [7 + 3] = -6 + 10 = 4$

$\therefore$ $[-6 + 7] + 3 = -6 + [7 + 3]$

(iv) Existence of additive identity : 0 is the additive identity of every integer a, *i.e.*

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

For example : $-5 + 0 = 0 + (-5) = -5$

(v) Existence of additive inverse : If a is an integer, then $-a$ is its additive inverse i.e.

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

For example : $5 + (-5) = 0$ or -5 is the additive inverse of 5 and 16 is the additive inverse of -16.

Note : 0 is the only integer whose additive inverse is same as the integer, *i.e.* the additive inverse of 0 is 0.

Properties of Integers under Subtraction

(i) Closure Property : The differences of two integers is also an integer.

Example : $2 - 5 = -3$ (an integer)

(ii) Commutative Property : For any two integers a and b, $a - b \neq b - a$, *i.e.* the subtraction of integers is not commutative.

Example : $5 - (-3) \neq -3 - (5)$

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

(iii) Associative Property : For any three integers a, b and c, $a - (b - c) \neq (a - b) - c$

Example : $-16 - [(-14) - 8] = -16 - (-22) = -16 + 22 = 6$

$[-16 - (-14)] - 8 = [-16 + 14] - 8 = -2 - 8 = -10$

$-16 - [(-14) - 8] \neq [-16 - (-14)] - 8$

Hence, subtraction of integers is not associative.

Try These *(With Solution)* (Page 4)

Q. 1. Write a pair of integers whose sum gives :

(a) a negative integer

(b) zero

(c) an integer smaller than both the integers.

(d) an integer smaller than only one of the integers.

(e) an integer greater than both the integers.

Solution : (a) $(-5) + 3 = -2$ (b) $(2) + (-2) = 0$ (c) $(-2) + (-5) = (-7)$

(d) $(-5) + 3 = -2$ (e) $5 + 2 = 7$

Q. 2. Write a pair of integers whose difference gives :

(a) a negative integer

(b) zero

(c) an integer smaller than both the integers.

(d) an integer greater than only one of the integers.

(e) an integer greater than both the integers.

Solution : (a) 4 and 9

Difference : $4 - 9 = -5$ (negative integer)

(b) -6 and -6

Difference : $-6 - (-6) = 0$

(c) 8 and 5

Difference : $8 - 5 = 3$

(3 is smaller than 8 as well as 5)

(d) 13 and 4

Difference : $13 - 4 = 9$

(9 is greater than 4)

(e) 11 and -7

Difference : $11 - (-7) = 18$

(18 is greater than 11 as well as -7)

EXERCISE 1.1

Q. 1. Write down a pair of integers whose :

(a) sum is – 7 (b) difference is – 10 (c) sum is 0

Solution : (a) $(-3) + (-4) = -7$ (b) $(-7) - 3 = -10$ (c) $(-2) + 2 = 0$

Q. 2. (a) Write a pair of negative integers whose difference gives 8.

(b) Write a negative integer and a positive integer whose sum is – 5.

(c) Write a negative integer and a positive integer whose difference is – 3.

Solution : (a) (– 5) – (– 13) = – 5 + 13 = 8 (b) (– 15) + 10 = – 5 (c) (– 2) – (1) = – 3

Q. 3. In a quiz, team A scored – 40, 10, 0 and team B scored 10, 0, – 40 in three successive rounds. Which team scored more? Can we say that we can add integers in any order?

Solution : Scores of team A = (– 40) + 10 + 0 = – 30

Total scores of team B = 10 + 0 + (– 40) = – 30, hence both team scored equal.

Yes, we can add integers in any order (by commutative property).

Q. 4. Fill in the blanks to make the following statements true :

(i) (– 5) + (– 8) = (– 8) + (........) **(ii) – 53 + ... = – 53**

(iii) 17 + ... = 0 **(iv) [13 + (– 12)] + (.......) = 13 + [(– 12) + (– 7)]**

(v) (– 4) + [15 + (– 3)] = [– 4 + 15] + ...

Solution :

(i) (– 5) (Commutative property)

(ii) 0 (Additive inverse property)

(iii) (– 17) (Additive identity property)

(iv) (– 7) (Associative property)

(v) (– 3) (Associative property)

Multiplication of Integers

Multiplication of whole numbers is nothing but repeated addition :

For example : 5 + 5 + 5 = 3 × 5 = 15

Product of even numbers of negative integers is positive, whereas product of odd number of negative integers is negative.

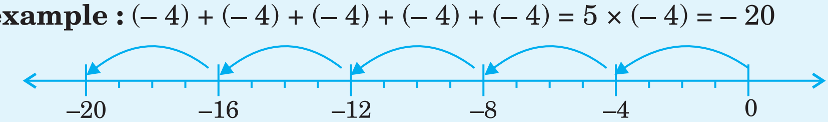
For example : (– 4) × (– 3) = + 12

(– 2) × (– 1) × (– 3) = – 6

(– 10) × (– 2) × (– 3) × (– 5) = 300

Multiplication of a positive and a negative integers on a number line :

For example : (– 4) + (– 4) + (– 4) + (– 4) + (– 4) = 5 × (– 4) = – 20

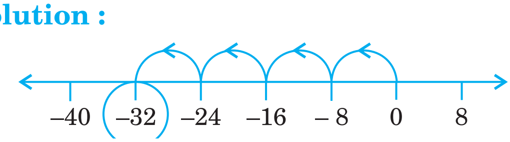


Try These (*With Solution*) (Page 5)

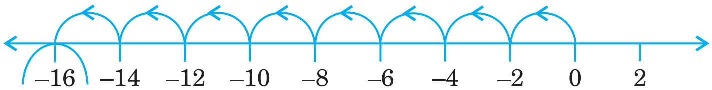
Q. Find : (i) 4 × (– 8) (ii) 8 × (– 2) (iii) 3 × (– 7) (iv) 10 × (– 1) using number line.

Solution :

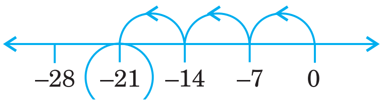
(i)



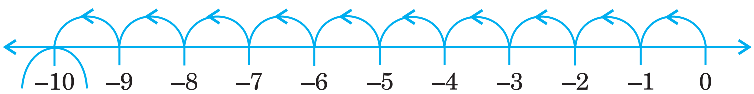
So, 4 × (– 8) = (– 32)

(ii) 

So, 8 × (– 2) = (– 16)

(iii) 

So, 3 × (– 7) = (– 21)

(iv) 

So, 10 × (– 1) = (– 10)

Multiplication of a positive and a negative integers without using number line

While multiplying a positive integer and a negative integer, we multiply them as whole numbers and put a (–) sign before the product. Thus, we get a negative integer.

For example : Find 3 × (– 5) in a different way.

First find 3 × 5 and then put minus sign (–) before the product obtained. You get – 15. Thus, we find – (3 × 5) = – 15.

Try These (*With Solution*) (Page 6)

Q. Find : (i) 6 × (– 19) (ii) 12 × (– 32) (iii) 7 × (– 22)

Solution : (i) 6 × (– 19) = – (6 × 19) = – 114

(ii) 12 × (– 32) = – (12 × 32) = – 384

(iii) 7 × (– 22) = – (7 × 22) = – 154

Try These (*With Solution*) (Page 7)

Q. 1. Find : (a) 15 × (– 16) (b) 21 × (– 32) (c) (– 42) × 12 (d) – 55 × 15

Solution : Since $-a \times b = -(a \times b) = a \times -b$

(a) – (15 × 16) = – 240

(b) – (21 × 32) = – 672

(c) – (42 × 12) = – 504

(d) – (55 × 15) = – 825

Q. 2. Check if (a) 25 × (– 21) = (– 25) × 21 (b) (– 23) × 20 = 23 × (– 20)

Write five more such examples.

Solution :

(a) LHS = 25 × (– 21) = – (25 × 21) = – 525

RHS = – 25 × 21 = – (25 × 21) = – 525

LHS = RHS

Hence verified.

(b) LHS = (– 23) × 20 = – (23 × 20) = – 460

RHS = (23) × (– 20) = – (23 × 20) = – 460

LHS = RHS

Hence verified.

Five more examples are :

(i) 15 × (– 16) = (– 15) × 16

(ii) (– 24) × 22 = 24 × (– 22)

(iii) (– 19) × 17 = 19 × (– 17)

(iv) 20 × (– 10) = (– 20) × 10

(v) 17 × (– 12) = (– 17) × 12

Try These (*With Solution*) (Page 8)

Q. 1. (i) Starting from (– 5) × 4, find (– 5) × (– 6)

(ii) Starting from (– 6) × 3, find (– 6) × (– 7)

Solution :

(i)
$-5 \times 4 = -20$
$-5 \times 3 = -15 = (-20) - (-5)$
$-5 \times 2 = -10 = (-15) - (-5)$
$-5 \times 1 = -5 = (-10) - (-5)$
$-5 \times 0 = 0 = -5 - (-5)$
$(-5) \times (-1) = 5 = 0 - (-5)$
$(-5) \times (-2) = 10 = 5 - (-5)$
$(-5) \times (-3) = 15 = +10 - (-5)$
$(-5) \times (-4) = 20 = 15 - (-5)$
$(-5) \times (-5) = 25 = 20 - (-5)$
$(-5) \times (-6) = 30 = 25 - (-5)$

(ii)
$(-6) \times 3 = -18$
$(-6) \times 2 = -12 = (-18) - (-6)$
$(-6) \times 1 = -6 = (-12) - (-6)$
$(-6) \times 0 = 0 = (-6) - (-6)$
$(-6) \times (-1) = 6 = 0 - (-6)$
$(-6) \times -2 = 12 = 6 - (-6)$
$(-6) \times (-3) = 18 = 12 - (-6)$
$(-6) \times -4 = 24 = 18 - (-6)$
$(-6) \times (-5) = 30 = 24 - (-6)$
$(-6) \times -6 = 36 = 30 - (-6)$
$(-6) \times (-7) = 42 = 36 - (-6)$

Note : The product of two negative integers is a positive integer. We multiply the two negative integers as whole numbers and put the positive sign before the product. In general, for any two positive integers a and b,

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

Try These (*With Solution*) (Page 8)

Q. Find : (i) (– 31) × (– 100) (ii) (– 25) × (– 72) (iii) (– 83) × (– 28)

Solution : Since $(-a) \times (-b) = a \times b$

(i) $31 \times 100 = 3100$ (ii) $25 \times 72 = 1800$ (iii) $83 \times 28 = 2324$

Properties of Integers under Multiplication

(i) Closure Property : The product of 2 integers is also an integer, i.e. if a, b and c are integers then

$$a \times b = c$$

For example : $13 \times (-5) = -65$, which is an integer.

(ii) Commutative Property : For any 2 integers a and b

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

For example : $(-4) \times (-5) = 20$ and $(-5) \times (-4) = 20$

$\therefore \quad (-4) \times (-5) = (-5) \times (-4)$

(iii) Multiplication by Zero : We know that any whole number when multiplied by zero gives zero. Let us observe the following table showing the product of a negative integer and zero.

$(-3) \times 0 = 0$
$0 \times (-4) = 0$
$(-5) \times 0 = 0$
$0 \times (-6) = 0$

This shows that the product of a negative integer and zero is zero.

In general, for any integer 'a'

$$a \times 0 = 0 \times a = 0$$

(iv) Multiplicative Identity : We know that 1 is the multiplicative identity for whole numbers. Let us observe the following table showing the product of a negative integer and 1.

$$(-3) \times 1 = -3, (-4) \times 1 = -4$$
$$1 \times (-5) = -5, 1 \times (-6) = -6$$

The table shows that 1 is the multiplicative identity for integers also. In general, for any integer 'a', we have :

$$a \times 1 = 1 \times a = a.$$

Multiplication with (– 1) : Let us observe the following table showing the product of an integer with (– 1).

$$(-3) \times (-1) = 3, 3 \times (-1) = -3$$
$$(-6) \times (-1) = 6, (-1) \times 13 = -13$$
$$(-1) \times (-25) = 25, 18 \times (-1) = -18$$

This shows that (– 1) is not the multiplication identity for integers as when multiply on integer with (– 1) or (– 1) with an integer, we do not get the same integer.

Therefore, for any integer 'a', we have :

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

(v) Associative Property : For 3 integers a, b and c, $a \times (b \times c) = (a \times b) \times c$

For example : $(-2) \times [6 \times (-5)] = (-2) \times (-30) = 60$

and $[(-2) \times 6] \times (-5) = (-12) \times (-5) = 60$

$\therefore$ $(-2) \times [6 \times (-5)] = [(-2) \times 6] \times (-5)$

The product of three integers does not depend upon the grouping of integers and this is called the associative property for multiplication of integers.

(vi) Distributive Property : If a, b and c are three integers, then :

(a) $a \times (b + c) = (a \times b) + (a \times c)$ → Distribution of addition over multiplication

(b) $a \times (b - c) = (a \times b) - (a \times c)$ → Distribution of subtraction over multiplication

For example :

$$(-2) \times [(-6) + 8] = -2 \times 2 = -4$$

and $[(-2) \times (-6)] + [(-2) \times 8] = 12 + (-16) = -4$

$\therefore$ $(-2) \times [(-6) + 8] = [(-2) \times (-6)] + [(-2) \times 8]$

Try These (*With Solution*) (Page 13)

Q. 1. (i) Is $10 \times [6 + (-2)] = 10 \times 6 + 10 \times (-2)$?

(ii) Is $(-15) \times [(-7) + (-1)] = (-15) \times (-7) + (-15) \times (-1)$?

Solution :

(i) LHS $= 10 \times [6 + (-2)]$ $= 10 \times 4 = 40$

RHS $= 10 \times 6 + 10 \times (-2)$ $= 60 + (-20) = 40$

$\therefore$ $10 \times [6 + (-2)] = 10 \times 6 + 10 \times (-2)$

(ii) LHS $= (-15) \times [(-7) + (-1)]$ $= -15 \times (-8) = 120$

RHS $= (-15) \times (-7) + (-15) \times (-1)$ $= 105 + 15 = 120$

$\therefore$ $-15 \times [(-7) + (-1)] = (-15) \times (-7) + (-15) \times (-1)$

Q. 2. (i) Is 10 × [6 – (– 2)] = 10 × 6 – 10 × (– 2)?
(ii) Is (– 15) × [(– 7) – (– 1)] = (– 15) × (– 7) – (– 15) × (– 1)?

Solution :

(i) LHS = 10 × [6 – (– 2)] = 10 × [6 + 2] = 10 × 8 = 80

RHS = 10 × 6 – 10 × (– 2) = 60 – (– 20) = 60 + 20 = 80

∴ 10 × [6 – (– 2)] = 10 × 6 – 10(– 2)

(ii) LHS = (– 15) × [(– 7) – (– 1)] = (– 15) × (– 7 + 1) = (– 15) × – 6 = 90

RHS = (– 15) × (– 7) – (– 15) × (– 1) = 105 – (15) = 90

∴ (– 15) × [(– 7) – (– 1)] = [(– 15) × (– 7)] – [(– 15) × (– 1)]

EXERCISE 1.2

Q. 1. Find each of the following products :

(a) 3 × (– 1) **(b) (– 1) × 225** **(c) (– 21) × (– 30)**
(d) (– 316) × (– 1) **(e) (– 15) × 0 × (– 18)** **(f) (– 12) × (– 11) × (10)**
(g) 9 × (– 3) × (– 6) **(h) (– 18) × (– 5) × (– 4)**
(i) (– 1) × (– 2) × (– 3) × 4 **(j) (– 3) × (– 6) × (– 2) × (– 1)**

Solution :
(a) 3 × (– 1) = – (3 × 1) = – 3
(b) (– 1) × 225 = – (1 × 225) = – 225
(c) (– 21) × (– 30) = + (21 × 30) = 630
(d) (– 316) × (– 1) = + (316 × 1) = 316
(e) (– 15) × 0 × (– 18) = 0
(f) (– 12) × (– 11) × (10) = (12 × 11 × 10) = 1320
(g) 9 × (– 3) × (– 6) = (9 × 3 × 6) = 162
(h) (– 18) × (– 5) × (– 4) = – 18 × (5 × 4) = – 18 × 20 = – 360
(i) (– 1) × (– 2) × (– 3) × 4 = – (1 × 2 × 3) × 4 = – 24
(j) (– 3) × (– 6) × (– 2) × (– 1) = (3 × 6 × 2 × 1) = 36

Q. 2. Verify the following :
(a) 18 × [7 + (– 3)] = [18 × 7] + [18 × (– 3)]
(b) (– 21) × [(– 4) + (– 6)] = [(– 21) × (– 4)] + [(– 21) × (– 6)]

Solution : (a) LHS = 18 × [7 + (– 3)] = 18 × 4 = 72
RHS = [18 × 7] + [18 × (– 3)] = 126 + (– 54) = 126 – 54 = 72
∴ LHS = RHS **Hence verified.**

(b) LHS = (– 21) × [(– 4) + (– 6)]
= – 21 × (– 10) = 210
RHS = [(– 21) × (– 4)] + [(– 21 × – 6)]
= 84 + 126 = 210
∴ LHS = RHS **Hence verified.**

Q. 3. (i) For any integer *a*, what is (– 1) × *a* equal to?
(ii) Determine the integer whose product with (– 1) is :
(a) – 22 **(b) 37** **(c) 0**

Solution : (i) – 1 × a = – (1 × a) = – a, where a is an integer.
(ii) (a) 22 (b) – 37 (c) 0

Q. 4. Starting from (– 1) × 5, write various products showing some pattern to show (– 1) × (– 1) = 1.

Solution : $(-1) \times 5 = -5$ $\quad$ $(-1) \times 4 = -4$

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

$(-1) \times 1 = -1$ $\quad$ $(-1) \times 0 = 0$

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

We conclude that the product of 1 negative and 1 positive integer is negative whereas the product of 2 negative integers is positive.

Division of Integers

If both dividend and divisor are of same signs, then the quotient will be positive, whereas if both dividend and divisor are of different signs, then the quotient will be netative.

$a \div (-b) = (-a) \div b$, where $b \neq 0$

$-a \div (-b) = a \div b$, where $b \neq 0$

For example : $(-36) \div 4 = -9$

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

$44 \div 4 = 11$

$39 \div (-13) = -3$

Division is the inverse operation of multiplication.

Try These (*With Solution*) (Page 15)

Q. Find : (a) (– 100) ÷ 5 (b) (– 81) ÷ 9 (c) (– 75) ÷ 5 (d) (– 32) ÷ 2

Solution : Since, $(-a) \div b = -(a \div b)$

(a) $(-100) \div 5 = -(100 \div 5) = -20$

(b) $(-81) \div 9 = -(81 \div 9) = -9$

(c) $(-75) \div 5 = -(75 \div 5) = -15$

(d) $(-32) \div 2 = -(32 \div 2) = -16$

Try These (*With Solution*) (Page 15)

Q. 1. Find : (a) 125 ÷ (– 25) (b) 80 ÷ (– 5) (c) 64 ÷ (– 16)

Solution : Since $a \div (-b) = -(a \div b)$

(a) $125 \div (-25) = -(125 \div 25) = -5$

(b) $80 \div (-5) = -(80 \div 5) = -16$

(c) $64 \div (-16) = -(64 \div 16) = -4$

Q. 2. Find : (a) (– 36) ÷ (– 4) (b) (– 201) ÷ (– 3) (c) (– 325) ÷ (– 13)

Solution : Since $(-a) \div (-b) = a \div b$

(a) $(-36) \div (-4) = (36 \div 4) = 9$

(b) $(-201) \div (-3) = (201 \div 3) = 67$

(c) $(-325) \div (-13) = (325 \div 13) = 25$

Property of Integers under Division

(i) Closure Property : If a and b are integers, then $a \div b$ may or may not be an integer.

For example : $16 \div (-4) = -4$, which is an integer, but $16 \div 5$ is not an integer.

Observe the following table :

Statement	Inference	Statement	Inference
$(-8) \div (-4) = 2$	Result is an integer.	$(-8) \div 3 = \frac{-8}{3}$	Result is not an integer.
$(-4) \div (-8) = \frac{-4}{-8}$	Result is not an integer.	$3 \div (-8) = \frac{3}{-8}$	Result is not an integer.

Therefore, we observe that integers are not closed under division.

(ii) Commutative Property : If a and b are 2 integers, then $\boldsymbol{a \div b \neq b \div a}$, *i.e.* Division of integers is not commutative.

For example : $6 \div (-3) = -2$ and $-3 \div 6 = \frac{-1}{2}$

$\therefore$ $6 \div (-3) \neq (-3) \div 6$

(iii) Division by Zero (0) : For any integer a, $a \div 0$ is not defined (meaningless).

However, for any integer a, $0 \div a = 0$ $(\because a \neq 0)$

For example : $-6 \div 0$ = not defined

But $0 \div (-6) = 0$

(iv) Division by 1 : Any integer divided by 1 gives the same integer. For any integer a,

$$\boldsymbol{a \div 1 = a}$$

However, $a \div (-1) = -(a \div 1) = -a$

For example : $23 \div 1 = 23$

While $23 \div (-1) = -23$

(v) Associative Property : For any 3 integers a, b and c,

$\boldsymbol{a \div (b \div c) \neq (a \div b) \div c}$, i.e. Division of integers is not associative.

For example : $20 \div [4 \div (-2)] = 20 \div (-2) = -10$

and $[20 \div 4] \div (-2) = 5 \div (-2) = \frac{-5}{2}$

$\therefore$ $20 \div [4 \div (-2)] \neq [20 \div 4] \div (-2)$

Try These (*With Solution*) (Page 16)

Q. Is (i) $1 \div a = 1$? (ii) $a \div (-1) = -a$?

For any integer a. Take different values of 'a' and check.

Solution : (i) $1 \div a = 1$ only if $a = 1$

(ii) Yes, $a \div (-1) = -a$, for all value of a.

Example : (i) If $a = -5$, then $a \div (-1) = (-5) \div (-1) = 5$

(ii) If $a = 12$, then $a \div (-1) = 12 \div (-1) = -12$

(iii) If $a = -2$, then $a \div (-1) = (-2) \div (-1) = 2$

EXERCISE 1.3

Q. 1. Evaluate each of the following :

(a) (– 30) ÷ 10 **(b) 50 ÷ (– 5)** **(c) (– 36) ÷ (– 9)**
(d) (– 49) ÷ 49 **(e) 13 ÷ [(– 2) + 1]** **(f) 0 ÷ (– 12)**
(g) (– 31) ÷ [(– 30) + (– 1)] **(h) [(– 36) ÷ 12] ÷ 3** **(i) [(– 6) + 5] ÷ [(– 2) +1]**

Solution : (a) (– 30) ÷ 10 = – (30 ÷ 10) = – 3
(b) 50 ÷ (– 5) = – (50 ÷ 5) = – 10
(c) (– 36) ÷ (– 9) = 36 ÷ 9 = 4
(d) (– 49) ÷ (49) = – (49 ÷ 49) = – 1
(e) 13 ÷ [(– 2) +1] = 13 ÷ (– 1) = – (13 ÷ 1) = – 13
(f) 0 ÷ (– 12) = 0
(g) (– 31) ÷ [(– 30) + (– 1)] = (– 31) ÷ (– 31) = 31 ÷ 31 = 1
(h) [(– 36) ÷ 12] ÷ 3 = (– 3) ÷ 3 = – (3 ÷ 3) = – 1
(i) [(– 6) + 5] ÷ [(– 2) + 1] = (– 1) ÷ (– 1) = (1 ÷ 1) = 1

Q. 2. Verify that $a \div (b + c) \neq (a \div b) + (a \div c)$ for each of the following values of a, b and c :

(a) a = 12, b = – 4, c = 2 **(b) a = (– 10), b = 1, c = 1**

Solution : (a) LHS $= a \div (b + c)$
$= 12 \div (-4 + 2)$
$= 12 \div (-2)$
$= -6$

RHS $= (a \div b) + (a \div c)$
$= (12 \div (-4) + (12 \div 2)$
$= -3 + 6$
$= 3$

∴ LHS ≠ RHS

(b) LHS $= a \div (b + c)$
$= -10 \div (1 + 1)$
$= -10 \div 2$
$= -5$

RHS $= (a \div b) + (a \div c)$
$= (-10 \div 1) + (-10 \div 1)$
$= -10 + (-10)$
$= -20$

∴ LHS ≠ RHS

Q. 3. Fill in the blanks :

(a) 369 ÷ ______ = 369 **(b) (– 75) ÷ _____ = – 1**
(c) (– 206) ÷ ____ = 1 **(d) – 87 ÷ ______ = 87**
(e) _____ ÷ 1 = – 87 **(f) _____ ÷ 48 = – 1**
(g) 20 ÷ ____ = – 2 **(h) _____ ÷ (4) = – 3**

Solution : (a) 1 (b) 75 (c) – 206 (d) – 1
(e) – 87 (f) – 48 (g) – 10 (h) – 12

Q. 4. Write five pairs of integers (a, b) such that $a \div b$ = – 3. One such pair is (6, – 2) because 6 ÷ (– 2) = (– 3).

Solution : (a) 12 ÷ (– 4) = – 3 (b) – 9 ÷ 3 = – 3
(c) 45 ÷ (– 15) = – 3 (d) (– 18) ÷ 6 = – 3
(e) – 21 ÷ 7 = – 3

Q. 5. The temperature at 12 noon was 10°C above zero. If it decreases at the rate of 2°C per hour until midnight, at what time would the temperature be 8°C below zero? What would be the temperature at mid-night?

Solution : Temperature at 12 noon = + 10°C