

# MATHEMATICS

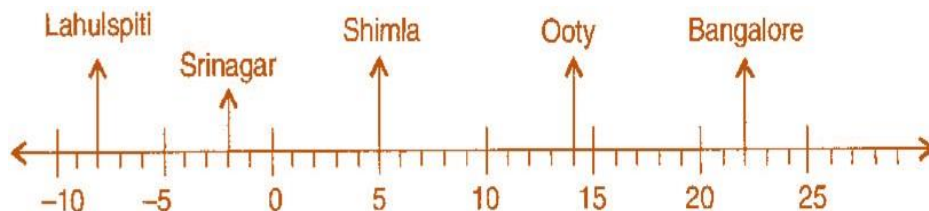
(Chapter – 1) (Integers)

(Class – VII)

## Exercise 1.1

### Question 1:

Following number line shows the temperature in degree Celsius ( $^{\circ}\text{C}$ ) at different places on a particular day:



- Observe this number line and write the temperature of the places marked on it.
- What is the temperature difference between the hottest and the coldest places among the above?
- What is the temperature difference between Lahulspiti and Srinagar?
- Can we say temperature of Srinagar and Shimla taken together is less than the temperature at Shimla? Is it also less than the temperature at Srinagar?

### Answer 1:

- (a) The temperature of the places marked on it is:

Places	Temperature	Places	Temperature
Bangalore	$22^{\circ}\text{C}$	Srinagar	$-2^{\circ}\text{C}$
Ooty	$14^{\circ}\text{C}$	Lahulspiti	$-8^{\circ}\text{C}$
Shimla	$5^{\circ}\text{C}$		

- (b) The temperature of the hottest place Bangalore =  $22^{\circ}\text{C}$   
 The temperature of the coldest place Lahulspiti =  $-8^{\circ}\text{C}$   
 Difference =  $22^{\circ}\text{C} - (-8^{\circ}\text{C}) = 22^{\circ}\text{C} + 8^{\circ}\text{C} = 30^{\circ}\text{C}$
- (c) The temperature of Srinagar =  $-2^{\circ}\text{C}$   
 The temperature of Lahulspiti =  $-8^{\circ}\text{C}$   
 Difference =  $-2^{\circ}\text{C} + (-8^{\circ}\text{C}) = -2^{\circ}\text{C} - 8^{\circ}\text{C} = 6^{\circ}\text{C}$
- (d) The temperature of Srinagar and Shimla =  $5^{\circ}\text{C} + (-2^{\circ}\text{C}) = 5^{\circ}\text{C} - 2^{\circ}\text{C} = 3^{\circ}\text{C}$   
 The temperature at Shimla =  $5^{\circ}\text{C}$   
 Therefore,  $3^{\circ}\text{C} < 5^{\circ}\text{C}$   
 Thus, temperature of Srinagar and Shimla taken together is less than the temperature at Shimla.  
 Now, Temperature of Srinagar =  $-2^{\circ}\text{C}$   
 Therefore,  $3^{\circ}\text{C} > -2^{\circ}\text{C}$   
 No, it is not less than the temperature at Srinagar.

**Question 2:**

In a quiz, positive marks are given for correct answers and negative marks are given for incorrect answers. If Jack's scores in five successive rounds were 25, -5, -10, 15 and 10, what was his total at the end?

**Answer 2:**

Jack's scores in five successive rounds are 25, -5, -10, 15 and 10.

$$\begin{aligned}\text{Total marks got by Jack} &= 25 + (-5) + (-10) + 15 + 10 \\ &= 25 - 5 - 10 + 15 + 10 \\ &= 25 - 15 + 10 = 20\end{aligned}$$

Thus, 20 marks are got by Jack in a quiz.

**Question 3:**

At Srinagar temperature was  $-5^{\circ}\text{C}$  on Monday and then it dropped by  $2^{\circ}\text{C}$  on Tuesday. What was the temperature of Srinagar on Tuesday? On Wednesday, it rose by  $4^{\circ}\text{C}$ . What was the temperature on this day?

**Answer 3:**

On Monday, temperature at Srinagar =  $-5^{\circ}\text{C}$

On Tuesday, temperature dropped =  $2^{\circ}\text{C}$

$$\therefore \text{Temperature on Tuesday} = -5^{\circ}\text{C} - 2^{\circ}\text{C} = -7^{\circ}\text{C}$$

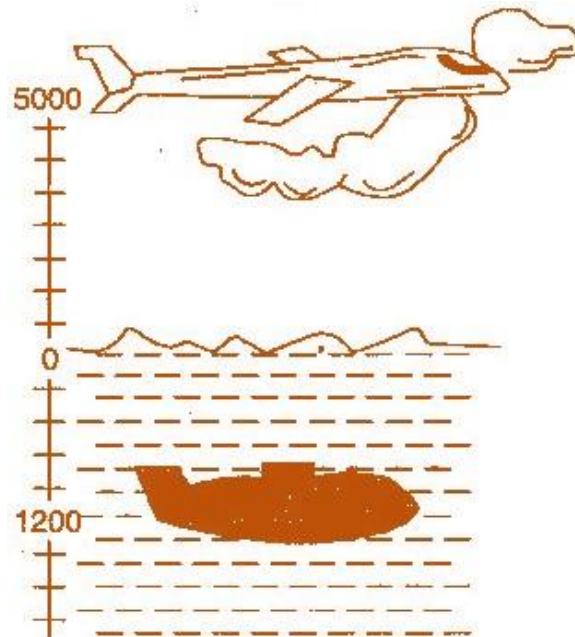
On Wednesday, temperature rose up =  $4^{\circ}\text{C}$

$$\therefore \text{Temperature on Wednesday} = -7^{\circ}\text{C} + 4^{\circ}\text{C} = -3^{\circ}\text{C}$$

Thus, temperature on Tuesday and Wednesday was  $-7^{\circ}\text{C}$  and  $-3^{\circ}\text{C}$  respectively.

**Question 4:**

A plane is flying at the height of 5000 m above the sea level. At a particular point, it is exactly above a submarine floating 1200 m below the sea level. What is the vertical distance between them?



**Answer 4:**

Height of a plane above the sea level = 5000 m

Floating a submarine below the sea level = 1200 m

∴ The vertical distance between the plane and the submarine  
= 5000 + 1200 = 6200 m

Thus, the vertical distance between the plane and the submarine is 6200 m.

**Question 5:**

Mohan deposits ₹2,000 in his bank account and withdraws ₹1,642 from it, the next day. If withdrawal of amount from the account is represented by a negative integer, then how will you represent the amount deposited? Find the balance in Mohan's accounts after the withdrawal?

**Answer 5:**

Deposit amount = ₹2,000 and Withdrawal amount = ₹1,642

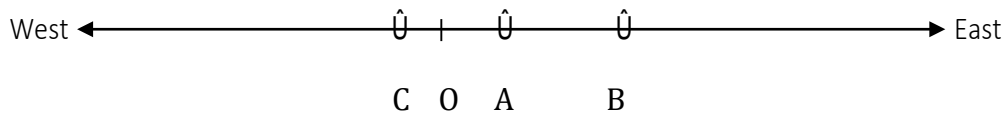
∴ Balance = 2,000 - 1,642 = ₹358

Thus, the balance in Mohan's account after withdrawal is ₹ 358.

**Question 6:**

Rita goes 20 km towards east from a point A to the point B. From B, she moves 30 km towards west along the same road. If the distance towards east is represented by a positive integer then, how will you represent the distance travelled towards west? By which integer will you represent her final position from A?

**Answer 6:**



According to the number line, Rita moves towards east is represented by a positive integer. But she moves in opposite direction means Rita moves west, is represented by negative integer.

- Distance from A to B = 20 km
- Distance from B to C = 30 km
- Distance from A to C = 20 - 30 = -10 km

Thus, Rita is at final position from A to C is -10 km.

**Question 7:**

In a magic square each row, column and diagonal have the same sum. Check which of the following is a magic square.

5	-1	-4
-5	-2	7
0	3	-3

(i)

1	-10	0
-4	-3	-2
-6	4	-7

(ii)

**Answer 7:**

- (i) Taking rows
  - $5 + (-1) + (-4) = 5 - 5 = 0$
  - $(-5) + (-2) + 7 = -7 + 7 = 0$
  - $0 + 3 + (-3) = 3 - 3 = 0$
- Taking columns
  - $5 + (-5) + 0 = 5 - 5 = 0$
  - $(-1) + (-2) + 3 = -3 + 3 = 0$
  - $(-4) + 7 + (-3) = 7 - 7 = 0$
- Taking diagonals
  - $5 + (-2) + (-3) = 5 - 5 = 0$



$$(-4) + (-2) + 0 = -6$$

This box is not a magic square because all the sums are not equal.

(ii) Taking rows	$1 + (-10) + 0 = 1 - 10 = -9$
	$(-4) + (-3) + (-2) = -7 - 2 = -9$
	$(-6) + 4 + (-7) = -2 - 7 = -9$
Taking columns	$1 + (-4) + (-6) = 1 - 10 = -9$
	$(-10) + (-3) + 4 = -13 + 4 = -9$
	$0 + (-2) + (-7) = 0 - 9 = -9$
Taking diagonals	$1 + (-3) + (-7) = 1 - 10 = -9$
	$0 + (-3) + (-6) = -9$

This box is magic square because all the sums are equal.

### Question 8:

Verify  $a - (-b) = a + b$  for the following values of  $a$  and  $b$  :

(i)  $a = 21, b = 18$

(ii)  $a = 118, b = 125$

(iii)  $a = 75, b = 84$

(iv)  $a = 28, b = 11$

### Answer 8:

(i) Given:  $a = 21, b = 18$

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

Putting the values in L.H.S. =  $a - (-b) = 21 - (-18) = 21 + 18 = 39$

Putting the values in R.H.S. =  $a + b = 21 + 18 = 39$

Since, L.H.S. = R.H.S

Hence, verified.

(ii) Given:  $a = 118, b = 125$

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

Putting the values in L.H.S. =  $a - (-b) = 118 - (-125) = 118 + 125 = 243$

Putting the values in R.H.S. =  $a + b = 118 + 125 = 243$

Since, L.H.S. = R.H.S

Hence, verified.

(iii) Given:  $a = 75, b = 84$   
 We have  $a - (-b) = a + b$   
 Putting the values in L.H.S. =  $a - (-b) = 75 - (-84) = 75 + 84 = 159$   
 Putting the values in R.H.S. =  $a + b = 75 + 84 = 159$   
 Since, L.H.S. = R.H.S  
 Hence, verified.

(iv) Given:  $a = 28, b = 11$   
 We have  $a - (-b) = a + b$   
 Putting the values in L.H.S. =  $a - (-b) = 28 - (-11) = 28 + 11 = 39$   
 Putting the values in R.H.S. =  $a + b = 28 + 11 = 39$   
 Since, L.H.S. = R.H.S  
 Hence, verified.

**Question 9:**

Use the sign of  $>$ ,  $<$  or  $=$  in the box to make the statements true:

- (a)  $(-8) + (-4) \square (-8) - (-4)$
- (b)  $(-3) + 7 - (19) \square 15 - 8 + (-9)$
- (c)  $23 - 41 + 11 \square 23 - 41 - 11$
- (d)  $39 + (-24) - (15) \square 36 + (-52) - (-36)$
- (e)  $(-231) + 79 + 51 \square (-399) + 159 + 81$

**Answer 9:**

- (a)  $(-8) + (-4) \square (-8) - (-4)$   
 $\Rightarrow -8 - 4 \square -8 + 4$   
 $\Rightarrow -12 \square -4$   
 $\Rightarrow -12 \square < -4$
- (b)  $(-3) + 7 - (19) \square 15 - 8 + (-9)$   
 $\Rightarrow -3 + 7 - 19 \square 15 - 8 - 9$

$$\Rightarrow 4 - 19 \square 15 - 17$$

$$\Rightarrow -15 \square -2$$

$$\Rightarrow -15 \square < -2$$

$$(c) 23 - 41 + 11 \square 23 - 41 - 11$$

$$\Rightarrow -18 + 11 \square 23 - 52$$

$$\Rightarrow -7 \square -29$$

$$\Rightarrow -7 \square > -29$$

$$(d) 39 + (-24) - (15) \square 36 + (-52) - (-36)$$

$$\Rightarrow 39 - 24 - 15 \square 36 - 52 + 36$$

$$\Rightarrow 39 - 39 \square 72 - 52$$

$$\Rightarrow 0 \square 20$$

$$\Rightarrow 0 \square < 20$$

$$(e) (-231) + 79 + 51 \square (-399) + 159 + 81$$

$$\Rightarrow -231 + 130 \square -399 + 240$$

$$\Rightarrow -101 \square -159$$

$$\Rightarrow -101 \square > -159$$

**Question 10:**

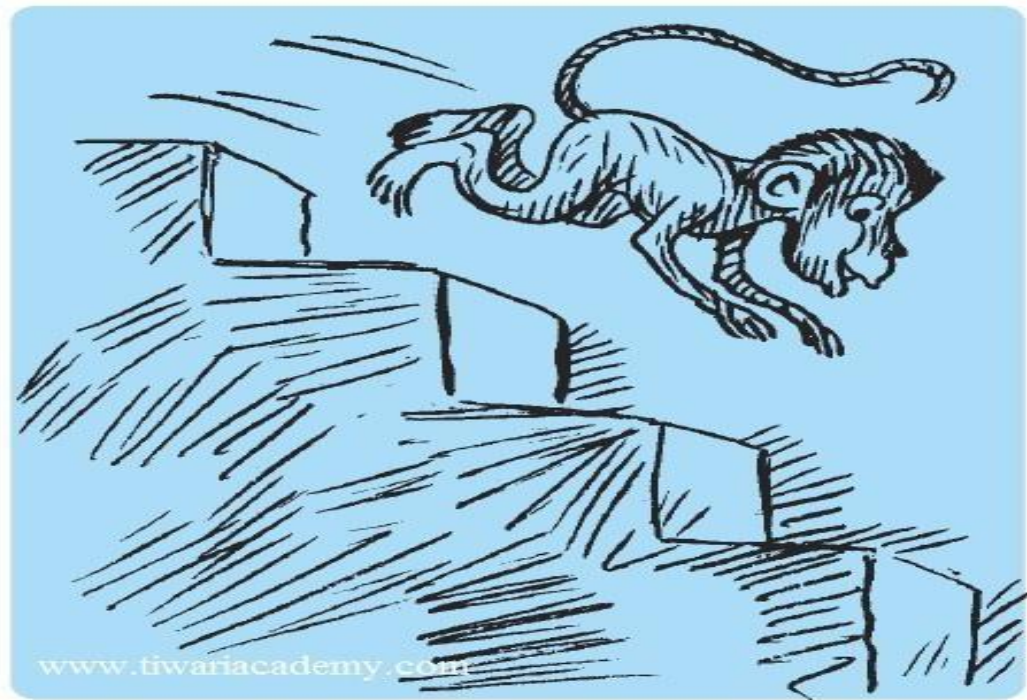
A water tank has steps inside it. A monkey is sitting on the topmost step (i.e., the first step). The water level is at the ninth step:

- (i) He jumps 3 steps down and then jumps back 2 steps up. In how many jumps will he reach the water level?
- (ii) After drinking water, he wants to go back. For this, he jumps 4 steps up and then jumps back 2 steps down in every move. In how many jumps will he reach back the top step?

(iii) If the number of steps moved down is represented by negative integers and the number of steps move up by positive integers, represent his moves in part (i) and (ii) by completing the following:

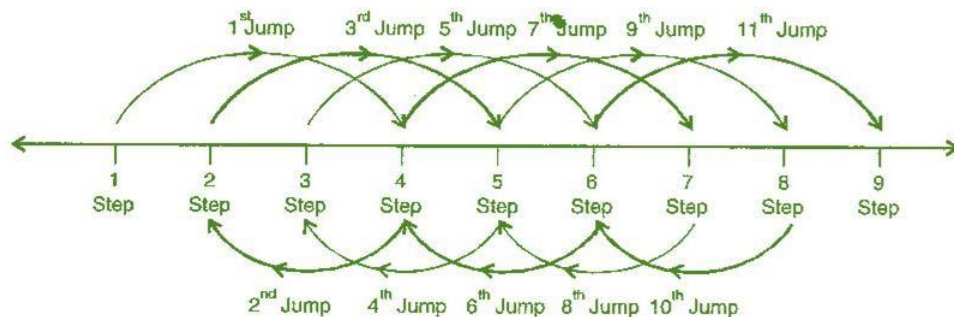
(a)  $-3 + 2 - \dots = -8$       (b)  $4 - 2 + \square = 8$

In (a) the sum  $(-8)$  represent going down by eight steps. So, what will the sum 8 in (b) represent?



**Answer 10:**

(i) He jumps 3 steps down and jumps back 2 steps up. Following number ray shows the jumps of monkey:



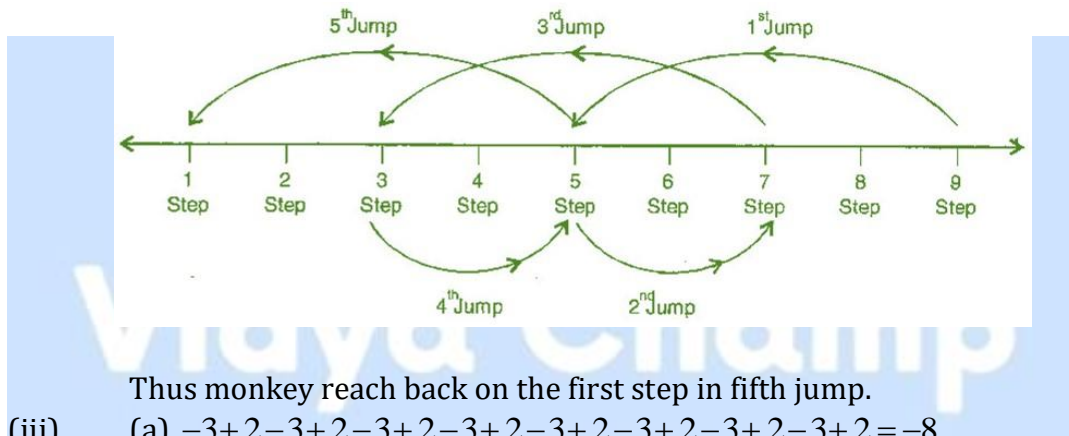
First jump =  $1 + 3 = 4$  steps





Second jump =  $4 - 2 = 2$  steps  
 Third jump =  $2 + 3 = 5$  steps  
 Fourth jump =  $5 - 2 = 3$  steps  
 Fifth jump =  $3 + 3 = 6$  steps  
 Sixth jump =  $6 - 2 = 4$  steps  
 Seventh jump =  $4 + 3 = 7$  steps  
 Eighth jump =  $7 - 2 = 5$  steps  
 Ninth jump =  $5 + 3 = 8$  steps  
 Tenth jump =  $8 - 2 = 6$  steps  
 Eleventh jump =  $6 + 3 = 9$  steps  
 He will reach ninth steps in 11 jumps.

- (ii) He jumps four steps and then jumps down 2 steps. Following number ray shows the jumps of monkey:



- (iii) (a)  $-3+2-3+2-3+2-3+2-3+2-3+2-3+2-3+2 = -8$   
 (b)  $4 - 2 + 4 - 2 + 4 - 2 + 4 - 2 = 8$

Thus, sum 8 in (b) represents going up by eight steps.

## Exercise 1.2

### Question 1:

Write down a pair of integers whose:

- (a) sum is  $-7$
- (b) difference is  $-10$
- (a) sum is  $0$

### Answer 1:

- (a) One such pair whose sum is  $-7$  :  $-5 + (-2) = -7$
- (b) One such pair whose difference is  $-10$  :  $-2 - 8 = -10$
- (c) One such pair whose sum is  $0$ :  $-5 + 5 = 0$

### Question 2:

- (a) Write a pair of negative integers whose difference gives  $8$ .
- (b) Write a negative integer and a positive integer whose is  $-5$ .
- (c) Write a negative integer and a positive integer whose difference is  $-3$ .

### Answer 2:

- (a)  $-2 - (-10) = -2 + 10 = 8$
- (b)  $(-7) + 2 = -5$
- (c)  $(-2) - 1 = -2 - 1 = -3$

### Question 3:

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

### Answer 3:

Team A scored  $-40, 10, 0$

Total score of Team A =  $-40 + 10 + 0 = -30$

Team B scored  $10, 0, -40$

Total score of Team B =  $10 + 0 + (-40) = 10 + 0 - 40 = -30$

Thus, scores of both teams are same.

Yes, we can add integers in any order due to commutative property.

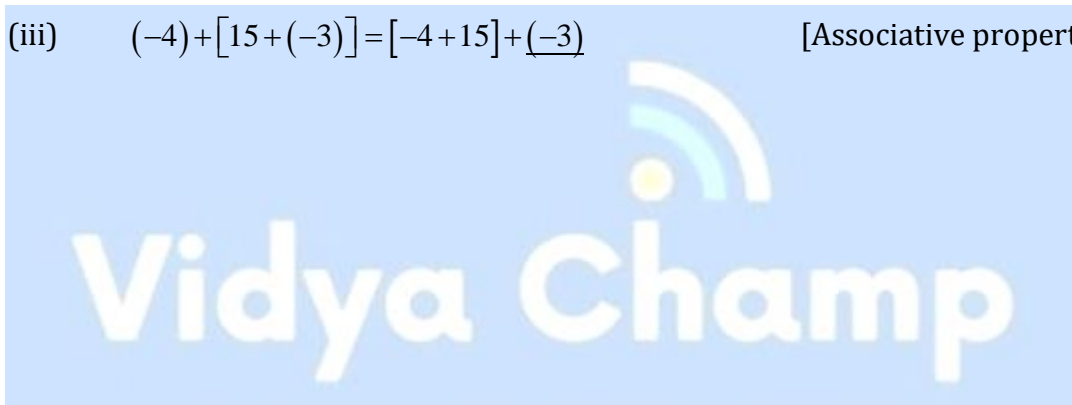
**Question 4:**

Fill in the blanks to make the following statements true:

- (i)  $(-5) + (-8) = (-8) + (\square)$   
(ii)  $-53 + \square = -53$   
(iii)  $17 + \dots = 0$   
(iv)  $[13 + (-12)] + (\dots) = 13 + [(-12) + (-7)]$   
(v)  $(-4) + [15 + (-3)] = [-4 + 15] + \dots$

**Answer 4:**

- (i)  $(-5) + (-8) = (-8) + (-5)$  [Commutative property]  
(ii)  $-53 + \underline{0} = -53$  [Zero additive property]  
(i)  $17 + (-17) = 0$  [Additive identity]  
(ii)  $[13 + (12)] + \underline{(-7)} = 13 + [(-12) + (-7)]$  [Associative property]  
(iii)  $(-4) + [15 + (-3)] = [-4 + 15] + \underline{(-3)}$  [Associative property]



### Exercise 1.3

**Question 1:**

Find the each of the following products:

(a)  $3 \times (-1)$

(c)  $(-21) \times (-30)$

(e)  $(-15) \times 0 \times (-18)$

(g)  $9 \times (-3) \times (-6)$

(i)  $(-1) \times (-2) \times (-3) \times 4$

(b)  $(-1) \times 225$

(d)  $(-316) \times (-1)$

(f)  $(-12) \times (-11) \times (10)$

(h)  $(-18) \times (-5) \times (-4)$

(j)  $(-3) \times (-6) \times (2) \times (-1)$

**Answer 1:**

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

(b)  $(-1) \times 225 = -225$

(c)  $(-21) \times (-30) = 630$

(d)  $(-316) \times (-1) = 316$

(e)  $(-15) \times 0 \times (-18) = 0$

(f)  $(-12) \times (-11) \times (10) = 132 \times 10 = 1320$

(g)  $9 \times (-3) \times (-6) = 9 \times 18 = 162$

(h)  $(-18) \times (-5) \times (-4) = 90 \times (-4) = -360$

(i)  $(-1) \times (-2) \times (-3) \times 4 = (-6 \times 4) = -24$

(j)  $(-3) \times (-6) \times (2) \times (-1) = (-18) \times (-2) = 36$

**Question 2:**

Verify the following:

(a)  $18 \times [7 + (-3)] = [18 \times 7] + [18 \times (-3)]$

(b)  $(-21) \times [(-4) + (-6)] = [(-21) \times (-4)] + [(-21) \times (-6)]$

**Answer 2:**

(a)  $18 \times [7 + (-3)] = [18 \times 7] + [18 \times (-3)]$

$$\Rightarrow 18 \times 4 = 126 + (-54)$$

$$\Rightarrow 72 = 72$$

$$\Rightarrow \text{L.H.S.} = \text{R.H.S.}$$

Hence verified.

(b)  $(-21) \times [(-4) + (-6)] = [(-21) \times (-4)] + [(-21) \times (-6)]$

$$\Rightarrow (-21) \times (-10) = 84 + 126$$

$$\Rightarrow 210 = 210$$

$$\Rightarrow \text{L.H.S.} = \text{R.H.S.}$$

Hence verified.

**Question 3:**

- (i) For any integer  $a$ , what is  $(-1) \times a$  equal to?  
(ii) Determine the integer whose product with  $(-1)$  is:  
(a)  $-22$                       (b)  $37$                       (c)  $0$

**Answer 3:**

- (i)  $(-1) \times a = -a$ , where  $a$  is an integer.  
(ii) (a)  $(-1) \times (-22) = 22$   
(b)  $(-1) \times 37 = -37$   
(c)  $(-1) \times 0 = 0$

**Question 4:**

Starting from  $(-1) \times 5$ , write various products showing some patterns to show  $(-1) \times (-1) = 1$ .

**Answer 4:**

$$\begin{array}{ll} (-1) \times 5 = -5 & (-1) \times 4 = -4 \\ (-1) \times 3 = -3 & (-1) \times 2 = -2 \\ (-1) \times 1 = -1 & (-1) \times 0 = 0 \\ (-1) \times (-1) = 1 & \end{array}$$

Thus, we can conclude that this pattern shows the product of one negative integer and one positive integer is negative integer whereas the product of two negative integers is a positive integer.

**Question 5:**

Find the product, using suitable properties:

- (a)  $26 \times (-48) + (-48) \times (-36)$                       (b)  $8 \times 53 \times (-125)$   
(c)  $15 \times (-25) \times (-4) \times (-10)$                       (d)  $(-41) \times (102)$   
(e)  $625 \times (-35) + (-625) \times 65$                       (f)  $7 \times (50 - 2)$   
(g)  $(-17) \times (-29)$                       (h)  $(-57) \times (-19) + 57$

**Answer 5:**

$$(a) 26 \times (-48) + (-48) \times (-36)$$

$$\Rightarrow (-48) \times [26 + (-36)]$$

[Distributive property]

$$\Rightarrow (-48) \times (-10)$$

$$\Rightarrow 480$$

$$(b) 8 \times 53 \times (-125)$$

$$\Rightarrow 53 \times [8 \times (-125)]$$

[Commutative property]

$$\Rightarrow 53 \times (-1000)$$

$$\Rightarrow -53000$$

$$(c) 15 \times (-25) \times (-4) \times (-10)$$

$$\Rightarrow 15 \times [(-25) \times (-4) \times (-10)]$$

[Commutative property]

$$\Rightarrow 15 \times (-1000)$$

$$\Rightarrow -15000$$

$$(d) (-41) \times (102)$$

$$\Rightarrow -41 \times [100 + 2]$$

[Distributive property]

$$\Rightarrow [(-41) \times 100] + [(-41) \times 2]$$

$$\Rightarrow -4100 + (-82)$$

$$\Rightarrow -4182$$

$$(e) 625 \times (-35) + (-625) \times 65$$

$$\Rightarrow 625 \times [(-35) + (-65)]$$

[Distributive property]

$$\Rightarrow 625 \times (-100)$$

$$\Rightarrow -62500$$

$$(c) 7 \times (50 - 2)$$

$$\Rightarrow 7 \times 50 - 7 \times 2$$

[Distributive property]

$$\Rightarrow 350 - 14 = 336$$



$$(d) (-17) \times (-29)$$

$$\Rightarrow (-17) \times [(-30) + 1] \quad \text{[Distributive property]}$$

$$\Rightarrow (-17) \times (30) + (-17) \times 1$$

$$\Rightarrow 510 + (-17)$$

$$\Rightarrow 493$$

$$(e) (-57) \times (-19) + 57$$

$$\Rightarrow (-57) \times (-19) + 57 \times 1$$

$$\Rightarrow 57 \times 19 + 57 \times 1$$

$$\Rightarrow 57 \times (19 + 1) \quad \text{[Distributive property]}$$

$$\Rightarrow 57 \times 20 = 1140$$

**Question 6:**

A certain freezing process requires that room temperature be lowered from  $40^{\circ}\text{C}$  at the rate of  $5^{\circ}\text{C}$  every hour. What will be the room temperature 10 hours after the process begins?

**Answer 6:**

Given: Present room temperature =  $40^{\circ}\text{C}$

Decreasing the temperature every hour =  $5^{\circ}\text{C}$

Room temperature after 10 hours =  $40^{\circ}\text{C} + 10 \times (-5^{\circ}\text{C})$

$$= 40^{\circ}\text{C} - 50^{\circ}\text{C}$$

$$= -10^{\circ}\text{C}$$

Thus, the room temperature after 10 hours is  $-10^{\circ}\text{C}$  after the process begins.

**Question 7:**

In a class test containing 10 questions, 5 marks are awarded for every correct answer and  $(-2)$  marks are awarded for every incorrect answer and 0 for questions not attempted.

- (i) Mohan gets four correct and six incorrect answers. What is his score?
- (ii) Reshma gets five correct answers and five incorrect answers, what is her score?
- (iii) Heena gets two correct and five incorrect answers out of seven questions she attempts. What is her score?

**Answer 7:**

- (i) Mohan gets marks for four correct questions =  $4 \times 5 = 20$   
He gets marks for six incorrect questions =  $6 \times (-2) = -12$   
Therefore, total scores of Mohan =  $(4 \times 5) + [6 \times (-2)]$   
 $= 20 - 12 = 8$   
Thus, Mohan gets 8 marks in a class test.
- (ii) Reshma gets marks for five correct questions =  $5 \times 5 = 25$   
She gets marks for five incorrect questions =  $5 \times (-2) = -10$   
Therefore, total score of Resham =  $25 + (-10) = 15$   
Thus, Reshma gets 15 marks in a class test.
- (iii) Heena gets marks for two correct questions =  $2 \times 5 = 10$   
She gets marks for five incorrect questions =  $5 \times (-2) = -10$   
Therefore, total score of Resham =  $10 + (-10) = 0$   
Thus, Reshma gets 0 marks in a class test.

**Question 8:**

A cement company earns a profit of ₹8 per bag of white cement sold and a loss of ₹ 5 per bag of grey cement sold.

- (a) The company sells 3,000 bags of white cement and 5,000 bags of grey cement in a month. What is its profit or loss?  
(b) What is the number of white cement bags it must sell to have neither profit nor loss. If the number of grey bags sold is 6,400 bags.

**Answer 8:**

Given: Profit of 1 bag of white cement = ₹ 8

And Loss of 1 bag of grey cement = ₹ 5

(a) Profit on selling 3000 bags of white cement =  $3000 \times ₹ 8 = ₹ 24,000$

Loss of selling 5000 bags of grey cement =  $5000 \times ₹ 5 = ₹ 25,000$

Since Profit < Loss

Therefore, his total loss on selling the grey cement bags = Loss - Profit

$$= ₹ 25,000 - ₹ 24,000$$

$$= ₹ 1,000$$

Thus, he has lost of ₹1,000 on selling the grey cement bags.





(b) Let the number of bags of white cement be  $x$ .

According to question, Loss = Profit

$$\therefore 5 \times 6,400 = x \times 8$$

$$\Rightarrow x = \frac{5 \times 6400}{8} = 5000 \text{ bags}$$

Thus, he must sell 4000 white cement bags to have neither profit nor loss.

### Question 9:

Replace the blank with an integer to make it a true statement:

(a)  $(-3) \times \square = 27$

(b)  $5 \times \square = -35$

(c)  $\square \times (-8) = -56$

(d)  $\square \times (-12) = 132$

### Answer 9:

(a)  $(-3) \times (-9) = 27$

(b)  $5 \times (-7) = -35$

(c)  $7 \times (-8) = -56$

(d)  $(-11) \times (-12) = 132$



### Exercise 1.4

**Question 1:**

Evaluate each of the following:

(a)  $(-30) \div 10$

(b)  $50 \div (-5)$

(c)  $(-36) \div (-9)$

(d)  $(-49) \div 49$

(e)  $13 \div [(-2) + 1]$

(f)  $0 \div (-12)$

(g)  $(-31) \div [(-30) \div (-1)]$

(h)  $[(-36) \div 12] \div 3$

(i)  $[(-6) + 5] \div [(-2) + 1]$

**Answer 1:**

(a)  $(-30) \div 10 = (-30) \times \frac{1}{10} = \frac{-30 \times 1}{10} = -3$

(b)  $50 \div (-5) = 50 \times \left( \frac{-1}{5} \right) = \frac{50 \times (-1)}{5} = -10$

(c)  $(-36) \div (-9) = (-36) \times \left( \frac{-1}{9} \right) = \frac{(-36) \times (-1)}{9} = \frac{36}{9} = 4$

(d)  $(-49) \div 49 = (-49) \times \frac{1}{49} = \frac{-49}{49} = -1$

(e)  $13 \div [(-2) + 1] = 13 \div (-1) = 13 \times \left( \frac{-1}{1} \right) = -13$

(f)  $0 \div (-12) = 0 \times \left( \frac{-1}{12} \right) = \frac{0}{12} = 0$

(g)  $(-31) \div [(-30) \div (-1)] = (-31) \div (-30 \div -1) = (-31) \div (-31) = (-31) \times \left( \frac{-1}{31} \right) = \frac{31}{31} = 1$

(h)  $[(-36) \div 12] \div 3 = [(-36) \times \frac{1}{12}] \div 3 = \left( \frac{-36}{12} \right) \div 3 = (-3) \div 3 = (-3) \times \frac{1}{3} = \frac{-3}{3} = -1$

(i)  $[(-6) + 5] \div [(-2) + 1] = (-6 + 5) \div (-2 + 1) = (-1) \div (-1) = (-1) \times \left( \frac{-1}{1} \right) = 1$



**Question 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)  $a = (-10), b = 1, c = 1$

**Answer 2:**

(a) Given:  $a \div (b + c) \neq (a \div b) + (a \div c)$   
 $a = 12, b = -4, c = 2$

Putting the given values in L.H.S. =  $12 \div (-4 + 2)$   
 $= 12 \div (-2) = 12 \div \left( \frac{-1}{2} \right) = \frac{-12}{2} = -6$

Putting the given values in R.H.S. =  $[12 \div (-4)] + (12 \div 2)$   
 $= \left( 12 \times \frac{-1}{4} \right) + 6 = -3 + 6 = 3$

Since, L.H.S.  $\neq$  R.H.S.  
Hence verified.

(b) Given:  $a \div (b + c) \neq (a \div b) + (a \div c)$   
 $a = -10, b = 1, c = 1$

Putting the given values in L.H.S. =  $-10 \div (1+1)$   
 $= -10 \div (2) = -5$

Putting the given values in R.H.S. =  $[-10 \div 1] + (-10 \div 1)$   
 $= -10 - 10 = -20$

Since, L.H.S.  $\neq$  R.H.S.  
Hence verified.

**Question 3:**

Fill in the blanks:

(a)  $369 \div \square\square\square = 369$  (c)

(b)  $(-75) \div \square\square = (-1)$  (d)

$(-206) \div \square\square\square = 1$  (e)  $\_ \div 1$

$(-87) \div \square\square = 87$  (f)  $\_ \div 48 =$

$= -87$  (g)  $20 \div \square\square = -2$

-1

(h)  $\_\_\_\_\_\_ \div (4) = -3$



**Answer 3:**

(a)  $369 \div 1 = 369$

(b)  $(-75) \div 75 = (-1)$

(c)  $(-206) \div (-206) = 1$

(d)  $(-87) \div (-1) = 87$

(e)  $(-87) \div 1 = -87$

(f)  $(-48) \div 48 = -1$

(g)  $20 \div (-10) = -2$

(h)  $(-12) \div (4) = -3$

**Question 4:**

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

**Answer 4:**

(i)  $(-6) \div 2 = -3$

(ii)  $9 \div (-3) = -3$

(iii)  $12 \div (-4) = -3$

(iv)  $(-9) \div 3 = -3$

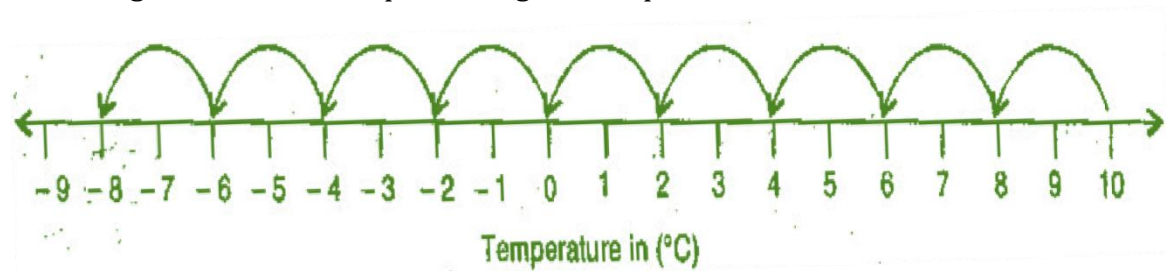
(v)  $(-15) \div 5 = -3$

**Question 5:**

The temperature at noon was  $10^{\circ}\text{C}$  above zero. If it decreases at the rate of  $2^{\circ}\text{C}$  per hour until mid-night, at what time would the temperature be  $8^{\circ}\text{C}$  below zero? What would be the temperature at mid-night?

**Answer 5:**

Following number line is representing the temperature:



The temperature decreases  $2^{\circ}\text{C} = 1$  hour

The temperature decreases  $1^{\circ}\text{C} = \frac{1}{2}$  hour

The temperature decreases  $18^{\circ}\text{C} = \frac{1}{2} \times 18 = 9$  hours

Total time = 12 noon + 9 hours = 21 hours = 9 pm

Thus, at 9 pm the temperature would be  $8^{\circ}\text{C}$  below  $0^{\circ}\text{C}$ .

### Question 6:

In a class test (+3) marks are given for every correct answer and (-2) marks are given for every incorrect answer and no marks for not attempting any question.

- (i) Radhika scored 20 marks. If she has got 12 correct answers, how many questions has she attempted incorrectly?
- (ii) Mohini scores (-5) marks in this test, though she has got 7 correct answers. How many questions has she attempted incorrectly?

### Answer 6:

- (i) Marks given for one correct answer = 3  
Marks given for 12 correct answers =  $3 \times 12 = 36$   
Radhika scored 20 marks.  
Therefore, Marks obtained for incorrect answers =  $20 - 36 = -16$   
Now, marks given for one incorrect answer = -2  
Therefore, number of incorrect answers =  $(-16) \div (-2) = 8$   
Thus, Radhika has attempted 8 incorrect questions.

- (ii) Marks given for seven correct answers =  $3 \times 7 = 21$   
Mohini scores = -5  
Marks obtained for incorrect answers =  $-5 - 21 = -26$   
Now, marks given for one incorrect answer = -2  
Therefore, number of incorrect answers =  $(-26) \div (-2) = 13$   
Thus, Mohini has attempted 13 incorrect questions.

**Question 7:**

An elevator descends into a mine shaft at the rate of 6 m/min. If the descent starts from 10 above the ground level, how long will it take to reach  $-350$  m?

**Answer 7:**

Starting position of mine shaft is 10 m above the ground but it moves in opposite direction so it travels the distance  $(-350)$  m below the ground.

So total distance covered by mine shaft =  $10 \text{ m} - (-350) \text{ m} = 10 + 350 = 360 \text{ m}$

Now, time taken to cover a distance of 6 m by it = 1 minute

So, time taken to cover a distance of 1 m by it =  $\frac{1}{6}$  minute

Therefore, time taken to cover a distance of 360 m =  $\frac{1}{6} \times 360$

$$= 60 \text{ minutes} = 1 \text{ hour}$$

(Since 60 minutes = 1 hour)

Thus, in one hour the mine shaft reaches  $-350$  below the ground.

