Mathematics

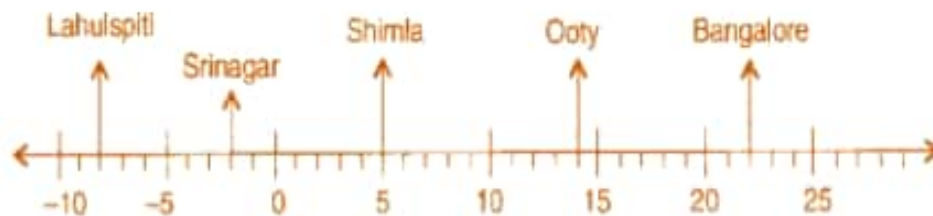## (Chapter – 1) (Integers)
(Class – VII)

Exercise 1.1

Question 1:

Following number line shows the temperature in degree Celsius (°C) at different places on a particular day:

(a) Observe this number line and write the temperature of the places marked on it.
(b) What is the temperature difference between the hottest and the coldest places among the above?
(c) What is the temperature difference between Lahulspiti and Srinagar?
(d) 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°C	Srinagar	–2°C
Ooty	14°C	Lahulspiti	–8°C
Shimla	5°C		

(b) The temperature of the hottest place Bangalore = 22°C
The temperature of the coldest place Lahulspiti = –8°C
Difference = 22°C – (–8°C) = 22°C + 8°C = 30°C

(c) The temperature of Srinagar = –2°C
The temperature of Lahulspiti = –8°C
Difference = –2°C + (–8°C) = –2°C –8°C = 6°C

(d) The temperature of Srinagar and Shimla = 5°C + (–2°C) = 5°C –2°C = 3°C
The temperature at Shimla = 5°C
Therefore, 3°C < 5°C
Thus, temperature of Srinagar and Shimla taken together is less than the temperature at Shimla.
Now, Temperature of Srinagar = –2°C
Therefore, 3°C > –2°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.

$$\text{Total marks got by Jack} = 25 + (-5) + (-10) + 15 + 10$$
$$= 25 - 15 + 25 = 35$$

Thus, 35 marks are got by Jack in a quiz.

Question 3:

At Srinagar temperature was −5° C on Monday and then it dropped by 2° C on Tuesday. What was the temperature of Srinagar on Tuesday? On Wednesday, it rose by 4° C. What was the temperature on this day?

Answer 3:

On Monday, temperature at Srinagar = −5ºC

On Tuesday, temperature dropped = 2ºC

∴ Temperature on Tuesday = −5ºC − 2ºC = −7ºC

On Wednesday, temperature rose up = 4ºC

∴ Temperature on Wednesday = −7ºC + 4ºC = −3ºC

Thus, temperature on Tuesday and Wednesday was −7ºC and −3ºC respectively.
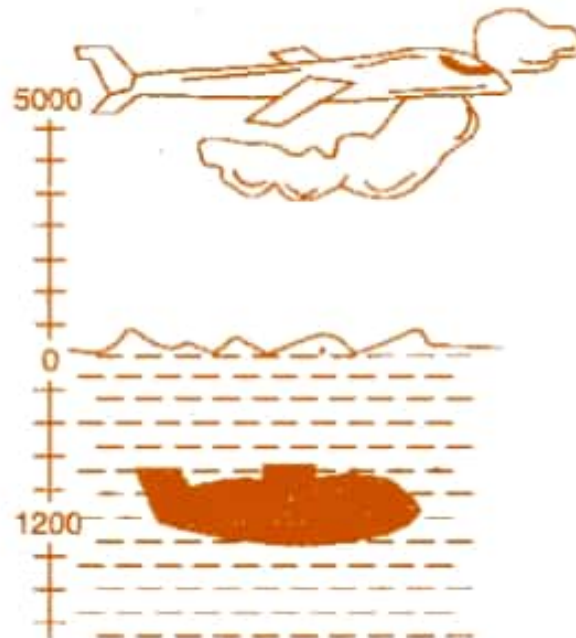
Question 4:

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 place 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:

West ◄─────────────── · ─┼─ · ─────── · ──────────► East

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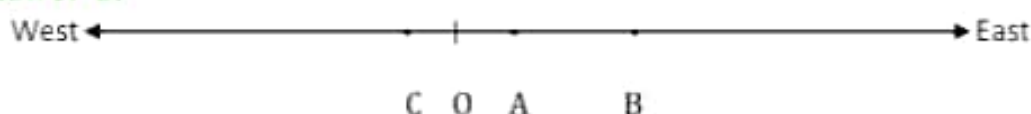
According to the number line, Rita moves towards east is represented by a positive integer. But she moves in opposite direction means Rita moves west, is represented by negative integer.

     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

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: $\qquad -5+(-2)=-7$

    (b) One such pair whose difference is –10: $\qquad -2-8=-10$

    (c) One such pair whose sum is 0: $\qquad -5+5=0$

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.

Exercise 1.3

Question 1:

Find the each of the following products:

(a) 3 x (−1)

(b) (−1) x 225

(c) (−21) x (−30)

(d) (−316) x (−1)

(e) (−15) x 0 x (−18)

(f) (−12) x (−11) x (10)

(g) 9 x (−3) x (−6)

(h) (−18) x (−5) x (−4)

(i) (−1) x (−2) x (−3) x 4

(j) (−3) x (−6) x (2) x (−1)

Answer 1:

(a) 3 x (−1) = −3

(b) (−1) x 225 = −225

(c) (−21) x (−30) = 630

(d) (−316) x (−1) = 316

(e) (−15) x 0 x (−18) = 0

(f) (−12) x (−11) x (10) = 132 x 10 = 1320

(g) 9 x (−3) x (−6) = 9 x 18 = 162

(h) (−18) x (−5) x (−4) = 90 x (−4) = −360

(i) (−1) x (−2) x (−3) x 4 = (−6 x 4) = −24

(j) (−3) x (−6) x (2) x (−1) = (−18) x (−2) = 36

Question 2:

Verify the following:

(a) 18 x [7 + (−3)] = [18 x 7] + [18 x (−3)]

(b) (−21) x [(−4) + (−6)] = [(−21) x (-4)] + [(−21) x (−6)]

Answer 2:

(a) 18 x [7 + (−3)] = [18 x 7] + [18 x (−3)]

⇒ 18 x 4 = 126 + (−54)

⇒ 72 = 72

⇒ L.H.S. = R.H.S.

Hence verified.

(b) (−21) x [(−4) + (−6)] = [(−21) x (−4)] + [(−21) x (−6)]

⇒ (−21) x (−10) = 84 + 126

⇒ 210 = 210

⇒ L.H.S. = 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:

$(-1) \times 5 = -5$ $(-1) \times 4 = -4$

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

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

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

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

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

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

$\Rightarrow \quad 480$

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

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

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

$\Rightarrow \quad -53000$

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

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

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

$\Rightarrow \quad -15000$

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

$\Rightarrow \quad -41 \times [100 + 2]$ [Distributive property]

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

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

$\Rightarrow \quad -4182$

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

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

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

$\Rightarrow \quad -62500$

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

$\Rightarrow \quad 7 \times 50 - 7 \times 2$ [Distributive property]

$\Rightarrow \quad 350 - 14 = 336$

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

$\Rightarrow \qquad (-17) \times [(-30)+1]$ [Distributive property]

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

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

$\Rightarrow \quad 493$

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

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

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

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

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

Question 6:

A certain freezing process requires that room temperature be lowered from 40°C at the rate of 5°C every hour. What will be the room temperature 10 hours after the process begins?

Answer 6:

Given: Present room temperature = 40°C

Decreasing the temperature every hour = 5°C

Room temperature after 10 hours   = 40°C + 10 x (−5°C)

= 40°C − 50°C

= − 10°C

Thus, the room temperature after 10 hours is − 10°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?

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