SpeedLabs
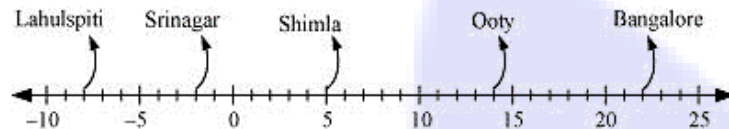## MATHS

CBSE 7th

TEEVRA EDUTECH PVT. LTD.

Q.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?

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

Places	Temperature
Bangalore	22° C
Ooty	14°C
Shimla	5°C
Srinagar	−2°C
Lahulspiti	−8°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 $=$ Difference $= -2°C - (-8°C)$

$= -2°C - 8°C$

$= 8°C = 6°C$

(d) The temperature of Srinagar and Shimla $= -2° C + 5° C = 3° C$

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.

Q.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?

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

Total marks got by Jack $= 25 + (-5) + (-10) + 15 + 10$

$= 25 - 5 - 10 + 15 + 10$

$= 25 - 15 + 25$

$= 35$

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

Q.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?

Sol: On Monday, temperature at Srinagar $= -5°$ C

On Tuesday, temperature dropped $= 2°$C

Temperature on Tuesday $= -5°$ C $- 2°$ C $= -7°$ C

On Wednesday, temperature rose up $= 4°$C

Temperature on Wednesday $= -7°$C $+ 4°$C $= -3°$C

Thus, temperature on Tuesday and Wednesday was $-7°$C and $-3°$C respectively.

Q.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?

Sol: 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.

Q.5 Mohan deposits Rs. 2,000 in his bank account and withdraws Rs. 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?

Sol: Deposit amount $=$ Rs. 2,000 and Withdrawal amount $=$ Rs. 1,642

Balance $= 2,000 - 1,642 =$ Rs. 358

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

Q.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?

Sol: 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, Rital is at final position from A to C is –10 km

Q.7 In a magic square each row, column and diagonal have the same sum. Check which of the following is a magic square.

(a)

5	−1	4
−5	−2	7
0	3	−3

(b)

1	−10	0
−4	−3	−2
−6	4	−7

Sol: (a) 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.

(b) 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.

Q.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

Sol: **(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 + 19 = 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 = 75,6 = 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.

Q.9 Use the sign of >, < or = in the box to make the statements true:

(a) (−8) + (−4) ☐ (−8) − (−4)

(b) (−3) + 7 − (19) ☐ 15 − 8 + (−9)

(c) 23 − 41 + 11 ☐ 3 − 41 − 11

(d) 39 + (−24) − (15) ☐ 36 + (−52) − (−36)

(e) (−231) + 79 + 51 ☐ (−399) + 159 + 81

Sol: **(a)** (−8) + (−4) ☐ (−8) − (−4)

$\Rightarrow -8 - 4$ ☐ $-8 + 4$

$\Rightarrow -12 < -4$

(b) (−3) + 7 − (19) ☐ 15 − 8 + (−9)

$\Rightarrow -3 + 7 - 19$ ☐ $15 - 8 - 9$

$\Rightarrow -15 < -2$

(c) 23 − 41 + 11 ☐ 23 − 41 − 11

$\Rightarrow -18 + 11$ ☐ $23 - 52$

$\Rightarrow -7 > -29$

(d) 39 + (−24) − (15) ☐ 36 + (−52) − (−36)

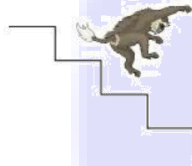$\Rightarrow 39 - 24 - 15 \boxed{} 36 - 52 + 36$

$\Rightarrow 0 < 20$

(e) $(-231) + 79 + 51 \boxed{} (-399) + 159 + 81$

$\Rightarrow -101 > -159$

Q.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 moved up by positive integers, represent his moves in part (i) and (ii) by completing the following;
(a) $- 3 + 2 - ... = - 8$ (b) $4 - 2 + ... = 8$. In (a) the sum $(- 8)$ represents going down by eight steps. So, what will the sum 8 in (b) represent?

Sol: (i) Initially, the monkey was at step $= 1$

After 1st jump, the monkey will be at step $= 1 + 3 = 4$

After 2nd jump, the monkey will be at step $= 4 + (-2) = 2$

After 3rd jump, the monkey will be at step $= 2 + 3 = 5$

After 4th jump, the monkey will be at step $= 5 + (-2) = 3$

After 5th jump, the monkey will be at step $= 3 + 3 = 6$

After 6th jump, the monkey will be at step $= 6 + (-2) = 4$

After 7th jump, the monkey will be at step $= 4 + 3 = 7$

After 8th jump, the monkey will be at step $= 7 + (-2) = 5$

After 9th jump, the monkey will be at step $= 5 + 3 = 8$

After 10th jump, the monkey will be at step $= 8 + (-2) = 6$

After 11th jump, the monkey will be at step $= 6 + 3 = 9$

Clearly, the monkey will be at water level (i.e., 9th step) after 11 jumps.

(ii) Initially, the monkey was at step $= 9$

After 1st jump, the monkey will be at step $= 9 + (-4) = 5$

After 2nd jump, the monkey will be at step $= 5 + 2 = 7$

After 3rd jump, the monkey will be at step $= 7 + (- 4) = 3$

After 4th jump, the monkey will be at step $= 3 + 2 = 5$

5

After 5th jump, the monkey will be at step $= 5 + (-4) = 1$

Clearly, the monkey will reach back at the top step after 5 jumps.

(iii) If steps moved down are represented by negative integers and steps moved up are represented by positive integers, then his moves will be as follows.

Moves in part (i)

$$-3 + 2 - 3 + 2 - 3 + 2 - 3 + 2 - 3 + 2 - 3 = -8$$

Moves in part (ii)

$$4 - 2 + 4 - 2 + 4 = 8$$

Moves in part (ii) represent going up 8 steps.