

TEACHERS FORUM®



QUESTION BANK

(solved)

Class VII

MATHEMATICS

SUBJECT EXPERTS

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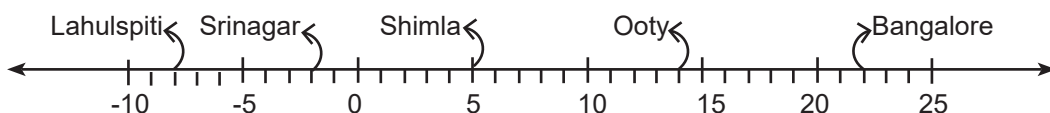
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INTEGERS

NCERT SOLUTIONS

EXERCISE 1.1

1. Following number line shows the temperature in degree celsius ($^{\circ}\text{C}$) 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?

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

Places	Bangalore	Ooty	Shimla	Srinagar	Lahulspiti
Temperature	22°C	14°C	5°C	-2°C	-8°C

(b) The temperature of the hottest place, Bangalore = 22°C

The temperature of the coldest place, Lahulspiti = -8°C

$$\text{Difference} = 22^{\circ}\text{C} - (-8^{\circ}\text{C}) = 22^{\circ}\text{C} + 8^{\circ}\text{C} = 30^{\circ}\text{C}$$

(c) The temperature of Srinagar = -2°C

The temperature of Lahulspiti = -8°C

$$\text{Difference} = -2^{\circ}\text{C} - (-8^{\circ}\text{C}) = -2^{\circ}\text{C} + 8^{\circ}\text{C} = 6^{\circ}\text{C}$$

(d) The sum of 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°C

So, temperature of Srinagar and Shimla taken together is less than the temperature at Shimla.

Now, Temperature at Srinagar = -2°C , ie., $3^{\circ}\text{C} > -2^{\circ}\text{C}$

No, it is not less than the temperature at Srinagar.

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?

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

$$= 25 - 15 + 25 = 35$$

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?

Ans. On Monday, temperature at Srinagar = -5°C

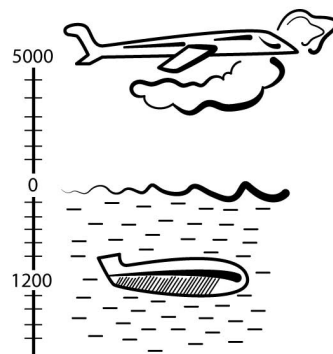
On Tuesday, temperature dropped = 2°C

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

On Wednesday, temperature rose up = 4°C

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

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?



Ans. Height of the plane above the sea level = 5000 m

Floating of submarine below the sea level = 1200 m

$$\therefore \text{The vertical distance between the plane and the submarine} = 5000 + 1200 = 6200 \text{ m.}$$

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 account after the withdrawal.

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

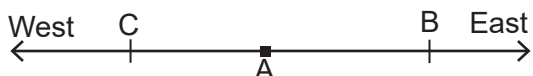
$$\therefore \text{Balance} = 2,000 - 1,642 = ₹ 358$$

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?



Ans. According to the number line, Rita moves towards east is represented by a positive integer and towards west, is represented by negative integer.

Integers



Distance from A to B = 20 km, Distance from B to C = 30 km

Distance from A to C = 20 – 30 = –10 km.

So, the final position from A to C is –10 km.

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

Ans. (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,

$$5 + (-2) + (-3) = 5 - 5 = 0$$

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

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

(i)

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

(ii)

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 a magic square because all the sums are equal.

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) $a = 28, b = 11$

Ans. (i) Given: $a = 21, b = 18$, We have $a - (-b) = a + b$

$$\text{L.H.S.} = a - (-b) = 21 - (-18) = 21 + 18 = 39$$

$$\text{R.H.S.} = a + b = 21 + 18 = 39$$

∴ L.H.S. = R.H.S. Hence, verified.

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

$$\text{L.H.S.} = a - (-b) = 118 - (-125) = 118 + 125 = 243$$

$$\text{R.H.S.} = a + b = 118 + 125 = 243 \quad \therefore \text{L.H.S.} = \text{R.H.S.} \text{ Hence, verified.}$$

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

$$\text{L.H.S.} = a - (-b) = 75 - (-84) = 75 + 84 = 159$$

$$\text{R.H.S.} = a + b = 75 + 84 = 159 \quad \therefore \text{L.H.S.} = \text{R.H.S.} \text{ Hence, verified.}$$

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

$$\text{L.H.S.} = a - (-b) = 28 - (-11) = 28 + 11 = 39$$

$$\text{R.H.S.} = a + b = 28 + 11 = 39 \quad \therefore \text{L.H.S.} = \text{R.H.S.} \text{ Hence, verified.}$$

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

Ans. (a) $(-8) + (-4) \square (-8) - (-4)$ (b) $(-3) + 7 - (19) \square 15 - 8 + (-9)$

$\Rightarrow -8 - 4 \square -8 + 4$ $\Rightarrow -3 + 7 - 19 \square 15 - 8 - 9$

$\Rightarrow -12 \square -4$ $\Rightarrow 4 - 19 \square 15 - 17$

$\Rightarrow -12 \square < -4$ $\Rightarrow -15 \square -2$

$\Rightarrow -15 \square < -2$

(c) $23 - 41 + 11 \square 23 - 41 - 11$ (d) $39 + (-24) - (15) \square 36 + (-52) - (-36)$

$\Rightarrow -18 + 11 \square 23 - 52$ $\Rightarrow 39 - 24 - 15 \square 36 - 52 + 36$

$\Rightarrow -7 \square -29$ $\Rightarrow 39 - 39 \square 72 - 52$

$\Rightarrow -7 \square > -29$ $\Rightarrow 0 \square 20$

$\Rightarrow 0 \square < 20$

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

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

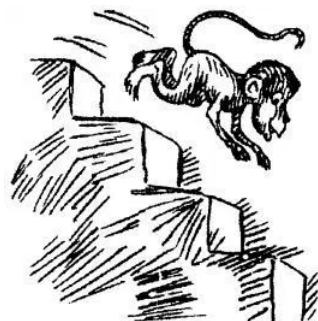
$\Rightarrow -101 \square -159$

$\Rightarrow -101 \square > -159$

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?



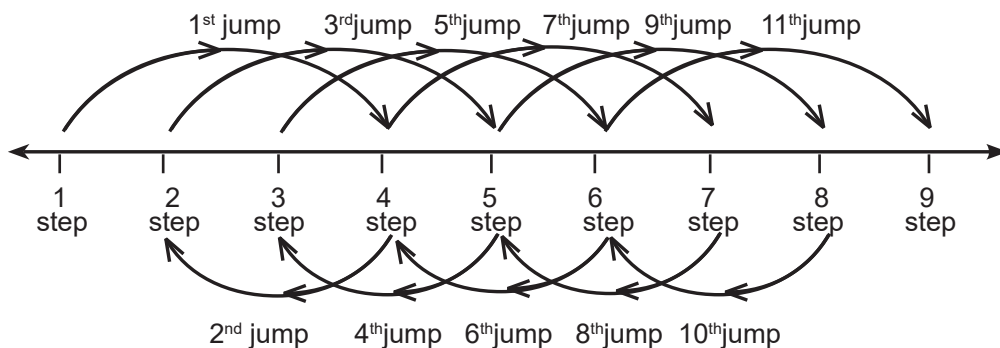
(iii) If the number of steps moved down is represented by negative integers and the number of steps moved up by positive integers, represent his moves in part (i) and (ii) by completing the following;

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

(b) $4 - 2 + \dots = 8$.

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

Ans. (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

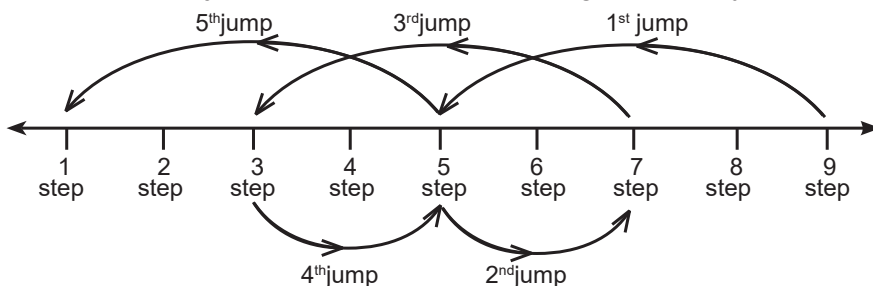
Ninth jump = $5 + 3 = 8$ steps

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:



Thus monkey reach back on the first step in fifth jump.

(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

1. Write down a pair of integers whose:

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

Ans. (a) One such pair whose sum is -7 : $-10 + (3) = -7$

(b) One such pair whose difference is -10 : $-7 - 3 = -10$

(c) One such pair whose sum is 0: $-1 + 1 = 0$

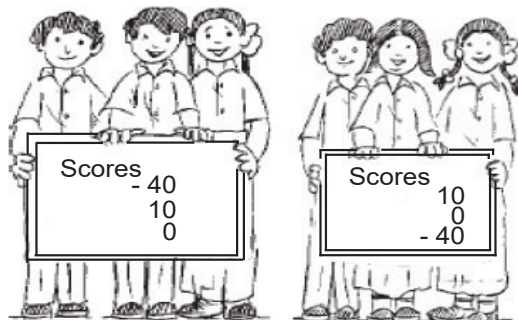
2. (a) Write a pair of negative integers whose difference gives 8.

(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 .

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

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?



Ans. Total score of Team

$A = -40 + 10 + 0 = -30$

Total score of Team

$B = 10 + 0 + (-40) = 10 + 0 - 40 = -30$

So the scores of both teams are same. Yes, we can add integers in any order due to commutative property.

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

(i) $(-5) + (\dots\dots\dots) = (-8) + (\dots\dots\dots)$ (ii) $-53 + \dots\dots\dots = -53$

(iii) $17 + \dots\dots\dots = 0$

(iv) $[13 + (-12)] + (\dots\dots\dots) = \dots\dots\dots + [(-12) + (-7)]$

(v) $(-4) + [\dots\dots\dots + (-3)] = [\dots\dots\dots + 15] + \dots\dots\dots$

Ans. (i) $(-5) + (-8) = (-8) + (-5)$ [Commutative property]

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

EXERCISE 1.3

1. Find each of the following products:

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

- Ans.** (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) $(-3) \times (-6) \times (-2) \times (-1) = (18) \times (2) = 36$

2. Verify the following:

- (a) $18 \times [7 + (-3)] = [18 \times 7] + [18 \times (-3)]$
 (b) $(-21) \times [(-4) + (-6)] = [(-21) \times (-4)] + [(-21) \times (-6)]$

- Ans.** (a) $18 \times [7 + (-3)] = [18 \times 7] + [18 \times (-3)]$
 $\Rightarrow 18 \times 4 = 126 + (-54)$
 $\Rightarrow 72 = 72 \Rightarrow$ L.H.S. = R.H.S. Hence verified.
 (b) $(-21) \times [(-4) + (-6)] = [(-21) \times (-4)] + [(-21) \times (-6)]$
 $\Rightarrow (-21) \times (-10) = 84 + 126$
 $\Rightarrow 210 = 210 \Rightarrow$ L.H.S. = R.H.S. Hence verified.

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

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

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

Ans. $(-1) \times 5 = -5,$ $(-1) \times 4 = -4,$ $(-1) \times 3 = -3,$ $(-1) \times 2 = -2,$
 $(-1) \times 1 = -1,$ $(-1) \times 0 = 0,$ $(-1) \times (-1) = 1$

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

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

$$= (-48) \times [26 + (-36)] = (-48) \times (-10) = 480 \quad \text{[Distributive property]}$$

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

$$= 53 \times [8 \times (-125)] = 53 \times (-1000) = -53000 \quad \text{[Commutative property]}$$

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

$$= 15 \times [(-25) \times (-4) \times (-10)] = 15 \times (-1000) = -15000 \quad \text{[Commutative property]}$$

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

$$= -41 \times [100 + 2] = [(-41) \times 100] + [(-41) \times 2] \quad \text{[Distributive property]}$$

$$= -4100 + (-82) = -4182$$

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

$$= 625 \times [(-35) + (-65)] = 625 \times (-100) = -62500 \quad \text{[Distributive property]}$$

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

$$= 7 \times 50 - 7 \times 2 = 350 - 14 = 336 \quad \text{[Distributive property]}$$

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

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

$$= 510 + (-17) = 493$$

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

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

$$= 57 \times (19 + 1) = 57 \times 20 = 1140$$

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?

Ans. Present room temperature = 40°C

Decreasing the temperature every hour = 5°C

Room temperature after 10 hours = $40^{\circ}\text{C} + 10 \times (-5^{\circ}\text{C}) = 40^{\circ}\text{C} - 50^{\circ}\text{C} = -10^{\circ}\text{C}$

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?

Ans. (i) Marks for four correct questions = $4 \times 5 = 20$

Marks for six incorrect questions = $6 \times (-2) = -12$

Therefore, total scores of Mohan = $20 + (-12) = 8$

(ii) Marks for five correct questions = $5 \times 5 = 25$

Marks for five incorrect questions = $5 \times (-2) = -10$

Therefore, total score of Reshma = $25 + (-10) = 15$

(iii) Marks for two correct questions = $2 \times 5 = 10$

Marks for five incorrect questions = $5 \times (-2) = -10$

Therefore, total score of Reshma = $10 + (-10) = 0$

8. A cement company earns a profit of Rs 8 per bag of white cement sold and a loss of Rs 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.

Ans. Profit of 1 bag of white cement = ₹ 8

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

His total loss on selling cement bags = Loss – Profit = ₹ 25,000 – ₹ 24,000 = ₹ 1,000

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

According to question, Loss = Profit

$$\therefore 5 \times 6,400 = x \times 8 \Rightarrow x = \frac{5 \times 6400}{8} = 4000 \text{ bags}$$

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

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

(a) $(-3) \times \underline{\quad} = 27$

(b) $5 \times \underline{\quad} = -35$

(c) $\underline{\quad} \times (-8) = -56$

(d) $\underline{\quad} \times (-12) = 132$

Ans. (a) $(-3) \times (-9) = 27$ (b) $5 \times (-7) = -35$ (c) $7 \times (-8) = -56$ (d) $(-11) \times (-12) = 132$

EXERCISE 1.4

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

(h) $[(-36) \div 12] \div 3$ (i) $[(-6) + 5] \div [(-2) + 1]$

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

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

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

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

Ans. (a) $a \div (b + c) \neq (a \div b) + (a \div c)$

Given : $a = 12, b = -4, c = 2$

L.H.S = $12 \div (-4 + 2)$

$$= 12 \div (-2) = 12 \times \left(\frac{-1}{2}\right) = \frac{-12}{2} = -6$$

$$\text{R.H.S.} = [12 \div (-4)] + (12 \div 2)$$

$$= \left(12 \times \frac{-1}{4}\right) + 12 \times \frac{1}{2} = -3 + 6 = 3$$

\Rightarrow L.H.S. \neq R.H.S. Hence verified.

(b) $a \div (b + c) \neq (a \div b) + (a \div c)$

Given : $a = -10, b = 1, c = 1$

$$\text{L.H.S} = -10 \div (1 + 1) = -10 \div (2) = -5$$

$$\text{R.H.S.} = [-10 \div 1] + (-10 \div 1) = -10 - 10 = -20$$

\Rightarrow L.H.S. \neq R.H.S. Hence verified.

3. Fill in the blanks:

(a) $369 \div \underline{\quad} = 369$

(b) $(-75) \div \underline{\quad} = -1$

(c) $(-206) \div \underline{\quad} = 1$

(d) $-87 \div \underline{\quad} = 87$

(e) $\underline{\quad} \div 1 = -87$

(f) $\underline{\quad} \div 48 = -1$

(g) $20 \div \underline{\quad} = -2$

(h) $\underline{\quad} \div (4) = -3$

Ans. (a) $369 \div \underline{1} = 369$

(b) $(-75) \div \underline{75} = (-1)$

(c) $(-206) \div \underline{(-206)} = 1$

(d) $(-87) \div \underline{(-1)} = 87$

(e) $\underline{(-87)} \div 1 = -87$

(f) $\underline{(-48)} \div 48 = -1$

(g) $20 \div \underline{(-10)} = -2$

(h) $\underline{(-12)} \div (4) = -3$

4. Write five pairs of integers (a, b) such that $a \div b = -3$.

One such pair is $(6, -2)$ because $6 \div (-2) = (-3)$.

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

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

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

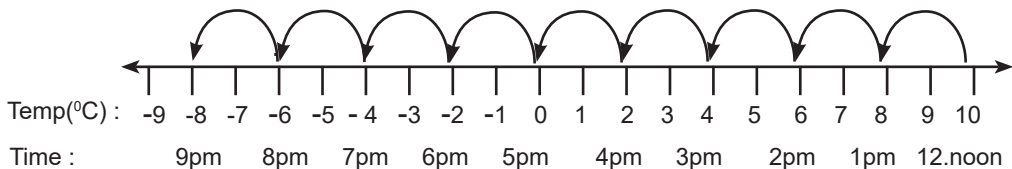
(iv) $(-18) \div 6 = -3$

(v) $(-30) \div 10 = -3$

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?

Ans. Following number line is representing the temperature:



So at 9 pm the temperature would be 8°C below 0°C .

If we continue that temperature at midnight will be -14°C

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?

Ans. (i) Marks given for one correct answer = 3

Marks given for 12 correct answers = $3 \times 12 = 36$, Radhika scored 20 marks.

So, marks obtained for incorrect answers = $20 - 36 = -16$

Now, marks given for one incorrect answer = –2

So, number of incorrect answers = $(-16) \div (-2) = 8$

(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.

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

Ans. 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 = $\frac{1}{6} \times 360 = 60 \text{ minutes} = 1 \text{ hour}$

Thus, in one hour the mine shaft reaches –350m below the ground.

Additional Questions and Answers

Multiple Choice Questions :

1. When the integers 10, 0, 5, – 5, – 7 are arranged in descending or ascending order, then find out which of the following integers always remains in the middle of the arrangement.

(a) 0

(b) 5

(c) – 7

(d) – 5

2. Next three consecutive numbers in the pattern 11, 8, 5, 2, --, --, -- are

(a) 0, – 3, – 6

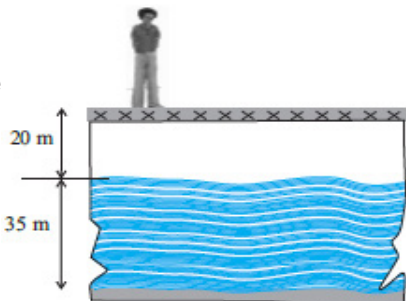
(b) – 1, – 5, – 8

(c) – 2, – 5, – 8

(d) – 1, – 4, – 7

3. The next number in the pattern – 62, – 37, – 12 _____ is

Integers

- (a) 25 (b) 13 (c) 0 (d) -13
4. $(-10) \times (-5) + (-7)$ is equal to
 (a) -57 (b) 57 (c) -43 (d) 43
5. Which of the following is the multiplicative identity for an integer a ?
 (a) a (b) 1 (c) 0 (d) -1
6. Madhre is standing in the middle of a bridge which is 20 m above the water level of a river. If a 35 m deep river is flowing under the bridge, then the vertical distance between the foot of Madhre and bottom level of the river is:
- 
- (a) 55 m (b) 35 m
 (c) 20 m (d) 15 m
7. $[(-10) \times (+9)] + (-10)$ is equal to
 (a) 100 (b) -100 (c) -80 (d) 80
8. $-16 \div [8 \div (-2)]$ is equal to
 (a) -1 (b) 1 (c) 4 (d) -4
9. At Shimla temperature was -5°C on Monday and then it dropped by 2°C on Tuesday. What was the temperature of Shimla on Tuesday?
 (a) -7°C (b) -3°C (c) 3°C (d) 7°C
10. 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?
 (a) 6200 m (b) 4800 m (c) 4000 m (d) 6000 m
11. In a quiz, positive marks are given for correct answers and negative marks are given for incorrect answers. If John's scores in five successive rounds were 25, -5, -10, 15 and 10, what was his total at the end?
 (a) 35 (b) 65 (c) 50 (d) 45

ANSWERS

1. a 2. d 3. b 4. d 5. b 6. a
 7. b 8. c 9. a 10. a 11. a

Fill in the blanks :

1. $(-43) + \underline{\hspace{2cm}} = -43$ 2. $(-8) + (-8) + (-8) = \underline{\hspace{2cm}} \times (-8)$
 3. $(-9) \times 20 = \underline{\hspace{2cm}}$ 4. $(-100) \div (-10) = \underline{\hspace{2cm}}$

5. $\underline{\hspace{2cm}} \div (-1) = -83$ 6. $51 \div \underline{\hspace{2cm}} = -51$
7. $113 \div \underline{\hspace{2cm}} = -1$ 8. $(-3) \times (-4) = \underline{\hspace{2cm}}$
9. $(-7) \times (-2) \times (-1) = \underline{\hspace{2cm}}$ 10. $(-15) \times [(-7) + (-1)] = \underline{\hspace{2cm}}$ 11. $45 \div (-3) = \underline{\hspace{2cm}}$
12. On a number line when we add a $\underline{\hspace{2cm}}$ integer, we move to the right.
13. The additive inverse of any integer 'a' is $\underline{\hspace{2cm}}$.
14. For any two integers a and b, $a + b$ is an $\underline{\hspace{2cm}}$.
15. For any integer a, $a \times 0 = 0 \times a = \underline{\hspace{2cm}}$.
16. For any integers a, b and c, we can say $a + (b + c) = \underline{\hspace{2cm}}$.
17. For any two integers a and b, $a \times b = \underline{\hspace{2cm}}$.
18. When two positive integers are added we get a $\underline{\hspace{2cm}}$ integer.

ANSWERS

1. 0 2. 3 3. -180 4. 10 5. 83 6. -1
7. -113 8. 12 9. -14 10. 120 11. -15 12. positive
13. -a 14. integer 15. 0 16. $(a + b) + c$ 17. $b \times a$ 18. positive

Answer the Following :

1. Find the odd one out of the four options in the following:
 (a) $(-2, 24)$ (b) $(-3, 10)$ (c) $(-4, 12)$ (d) $(-6, 8)$

Ans. Here $-2 \times 24 = -48$, $-4 \times 12 = -48$ and $-6 \times 8 = -48$

All the pairs i.e. $(-2, 24)$, $(-4, 12)$, $(-6, 8)$ give same answer on multiplication, whereas $-3 \times 10 = -30$, gives a different answer. So, odd one is (b).

2. Find the odd one out of the four options given below:

(a) $(-3, -6)$ (b) $(+1, -10)$ (c) $(-2, -7)$ (d) $(-4, -9)$

Ans. Here $-3 + (-6) = -9$, $+1 + (-10) = -9$ and $-2 + (-7) = -9$

All the above pairs i.e. $(-3, -6)$, $(+1, -10)$, $(-2, -7)$ give same answer on adding, whereas $-4 + (-9) = -13$, gives a different answer. So, odd one out is (d).

3. Match the integer in Column I to an integer in Column II so that the sum is between -11 and -4

Column I	Column II
(a) -6	(i) -11
(b) +1	(ii) -5
(c) +7	(iii) +1
(d) -2	(iv) -13

- Ans.** (a) - (iii),
 (b) - (i),
 (c) - (iv),

(d) - (ii)

4. Write a pair of integers whose sum is zero (0) but difference is 10.

Ans. Since sum of two integers is zero, one integer is the additive inverse of other integer, like $-3, 3; -4, 4$ etc. But the difference has to be 10. So, the integers are 5 and -5 as $5 - (-5)$ is 10.

5. Write two integers which are smaller than -3 , but their difference is greater than -3 .

Ans. (i) -5 and -4 are smaller than -3 but their difference is $(-4) - (-5) = 1$ which is greater than -3 .

(ii) -6 and -10 are smaller than -3 but their difference is $(-6) - (-10) = 4$ which is greater than -3 .

6. Write a pair of integers whose product is -15 and whose difference is 8.

Ans. There are few pairs of integers whose product is -15 .

e.g. $-1 \times 15, -3 \times 5, 3 \times (-5), 15 \times (-1)$

Here difference of -3 and 5 or -5 and 3 is 8. So the required pair of integers is $-3, 5$ and $-5, 3$.

7. If Δ is an operation such that for integers a and b we have $a \Delta b = a \times a + b \times b - a \times b$, then find $(-3) \Delta 2$.

Ans.
$$\begin{aligned} -3 \Delta 2 &= (-3) \times (-3) + 2 \times 2 - (-3) \times 2 \\ &= 9 + 4 - (-6) = 13 + 6 = 19. \end{aligned}$$

8. Find: (a) $(-36) \div (-4)$ (b) $(-201) \div (-3)$

Ans. (a) 9 (b) 67

9. In a class test containing 15 questions, 4 marks are given for every correct answer and (-2) marks are given for every incorrect answer. Gurpreet attempts all questions but only 9 of her answers are correct. What is her total score?

Ans. Gurpreet's total score = $9 \times 4 + 6 \times -2 = 36 + (-12) = 24$

10. In a class test containing 15 questions, 4 marks are given for every correct answer and (-2) marks are given for every incorrect answer. One of her friends gets only 5 answers correct. What will be her score?

Ans. Her friend's total score = $5 \times 4 + 10 \times -2 = 20 + (-20) = 0$

11. Suppose we represent the distance above the ground by a positive integer and that below the ground by a negative integer. An elevator descends into a mine shaft at the rate of 5 metres per minute. What will be its position after one hour?

Ans. Position of the elevator after 60 minutes = $(-5) \times 60 = -300$ m, i.e., 300 m below ground level.

**SELF ASSESSMENT TEST****Choose the correct answer:**

- The number of integers between -20 and -10 are
(a) 8 (b) 9 (c) 10 (d) 11
- If the sum of two integers is -10 and one of them is 2, then the other is
(a) 8 (b) -8 (c) 12 (d) -12
- The integer that must be subtracted from -5 to obtain -12 is
(a) 7 (b) -7 (c) 17 (d) -17
- $0 \div (-15)$ is equal to
(a) 0 (b) -1 (c) -15 (d) none of these
- $(-32) \times 102 + (-32) \times (-2)$ is equal to
(a) 3200 (b) -3200 (c) 3432 (d) -3432

Answer the following:

- Write a pair of integers whose sum gives (i) a negative integer (ii) zero
- Find the sum of integers 58, -236, -58, -64, -200.
- Verify : $(-50) \times [37 + (-7)] = (-50) \times 37 + (-50) \times (-7)$
- Find the products : (i) $7 \times (-35)$ (ii) $(-1) \times (-2) \times (-3) \times 4$
- Fill in the blanks to make the following statements true:
(i) $\dots \times (-13) = 143$ (ii) $(-5) \times \dots = 0$
- Evaluate the following :
(i) $(-31) \div [(-30) + (-1)]$ (ii) $[(-36) \div 12] \div 3$
(iii) $(-36) \div (-9)$ (iv) $0 \div (-17)$
(v) $17 - \{8 \div (2 \times 3 - 4)\}$ (vi) $2 \times 5 - [8 - \{11 + 30 \div (4 - (7 - 5))\}]$

**ANSWERS**

- (b) 9
- (d) -12
- (a) 7
- (a) 0
- (b) -3200
- (i) -8, 4 (ii) 6, -6
- 500
- (i) -245 (ii) -24
- (i) -11 (ii) 0
- (i) 1 (ii) -1 (iii) 4 (iv) 0 (v) 13 (vi) 28

