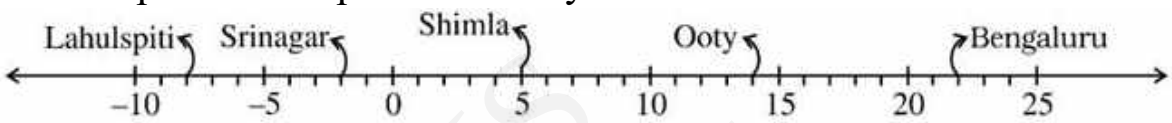
# Chapter – 1
# Integers

## Exercise 1.1

**1.** Following number line shows the temperature in degree Celsius(°C) at different places on a particulars 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:**

**(a)** By observing the above-given data, we can represent the temperature of cities as follows:

| Cities | Temperature |
|---|---|
| Lahulspiti | $-8°C$ |
| Srinagar | $-2°C$ |
| Shimla | $5°C$ |
| Ooty | $14°C$ |
| Bangalore | $22°C$ |

**(b)** From the above table, it is clear that:

Hottest place temperature $= 22°C$

Coolest place temperature $= -8°C$

Therefore,

Temperature difference = Hottest place temperature – Coolest place temperature

= 22 – (-8)

= 30℃

Hence,

Temperature between the hottest and coolest place is 30℃

**(c)** From the above table, it is clear that:

Temperature of Lahaul Spiti $= -8℃$

Temperature at Srinagar $= -2℃$

Therefore,

Temperature difference of both cities = Temperature of Lahulspiti - Temperature of Srinagar

= – 8 – (-2)

= – 8 + 2

$= -6℃$

Hence,

The temperature difference between Lahaul Spiti and Srinagar is $-6℃$.

**(d)** From the above table, it is clear that:

Temperature of Srinagar $= -2℃$

Also,

Temperature of Shimla $= 5℃$

Therefore,

Temperature of Srinagar and Shimla taken together = – 2 + 5

$= 3℃$

Since,

$3℃ > 5℃$

$3℃ <$ Temperature of Shimla

It is clear that temperature of Srinagar and Shimla taken together is less than the temperature of Shimla.

**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:**

It is given in the question that,

Scores of Jack in 5 successive rounds = 25, -5, -10, 15 and 10

Therefore,

The total score of Jack at the and will be the sum of scores of 5 successive rounds

Therefore,

Total score of jack $= 25 + (-5) + (-10) + 15 + 10$

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

$= 25 - 15 + 15 + 10$

$= 25 + 10$

$= 35$

**3.** At Srinagar, temperature was $-5℃$ on Monday and then it dropped by $2℃$ on Tuesday. What was the temperature of Srinagar on Tuesday? On Wednesday, it rose by $4℃$. What was the temperature on this day?

**Answer:**

It is given in the question that,

Temperature of Srinagar on Monday $= -5℃$

$\because$ The temperature of Srinagar on Tuesday = Temperature of Srinagar on Monday $-2℃$

$= -5 - 2$

$= -7℃$

The temperature of Srinagar on Wednesday = Temperature of Srinagar on Tuesday $+4℃$

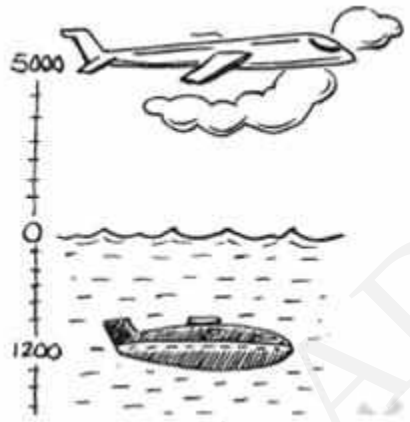
$= -7 + 4$

$= -3℃$

Therefore,

**The temperature of Srinagar on Tuesday and the temperature of Srinagar on Wednesday was $-7$℃ and $-3$℃ respectively.**

**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:**

It is given in the question that,

The height of plane = 5000 m

Also,

As submarine is below the water,

Depth of submarine = – 1200 m

Therefore,

The distance between plane and submarine = 5000 – (-1200)

= 5000 + 1200

= 6200 m

**5.** Mohan deposits Rs. 2,000 in his bank account and withdraws Rs. 1,642 form 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.

**Answer:**

**(a)** It is given in the question that,

The amount deposited in bank account = Rs 2000

Also,

Amount withdrawn from bank account = Rs 1642

Therefore,

Balance left in account = Amount deposited in bank account + Amount withdrawn from the bank account

= 2000 + (– 1642)

= 2000 – 1642

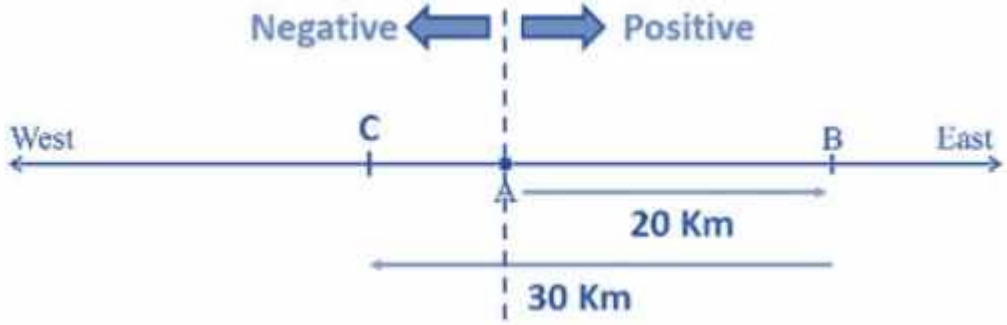
= 358

**Therefore, money left in Mohan's account after withdrawal is Rs 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?


**Answer:**

(a) We have



Distance towards the east is represented by positive whereas distance towards the west is represented by a negative integer

It is given in the question that,

Distance travelled in the east direction = 20 km

Also,

Distance travelled in west direction = 30 km

Therefore,

Distance travelled from A = 20 + (-30)

= – 10 km

As the distance is negative, so we will represent the distance travelled by Rita from A towards the west direction.

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

(i)

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

(ii)

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

**Answer:**

**(i)** Sum of the rows of the box,
5 – 1 – 4 = 0, -5 – 2 + 7 = 0, 0 + 3 – 3 = 0
Sum of the columns, 5 – 5 + 0 = 0, -5 – 2 + 7 = 0, 0 + 3 – 3 = 0
Sum of the diagonals, 5 – 2 – 3 = 0, 0 – 2 – 4 = -6.

As one of the diagonals does not equal to 0, it is not a magic square.

**(ii)** Sum of the rows,

$1 – 10 + 0 = -9, -4 – 3 – 2 = -9$

Sum of the columns, $1 – 4 – 6 = -9, -10 – 3 + 4 = -9, 0 – 2 – 7 = -9$

Sum of the diagonals, $1 – 3 – 7 = -9, 0 – 3 – 6 = 9$

As the sum of rows, columns and diagonals are equal. This is a magic square.

**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:**

**(i)** We have given in the question that,

$a = 21$

$b = 18$

We have to prove that:

$a – (-b) = 21 – (-18)$

$= 21 + 18$

Also,

$a + b = 21 + 18$

$= 39$

Therefore,

$a – (-b) = a + b$

Hence verified

**(ii)** We have given in the question that,

$A = 118$

$B = 125$

We have prove that:

$a – (-b) = a + b$

Now,

$a - (-b) = 118 - (-125)$

$= 118 + 125$

$= 243$

Also,

$a + b = 118 + 125$

$= 243$

Therefore,

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

Hence, verified

**(iii)** We have given in the question that,

$a = 75$

$b = 84$

We have to prove that:

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

Now,

$a - (-b) = 75 - (-84)$

$= 75 + 84$

$= 159$

Also,

$a + b = 75 + 84$

$= 159$

Therefore,

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

Hence verified,

**(iv)** We have given in the question that,

$a = 28$

$b = 11$

We have to prove that:

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

Now,

$a - (-b) = 28 - (-11)$

$= 28 + 11$

$= 39$

Therefore,

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

Hence, verified

**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)** 39 + (-24) – (15) ….. 36 + (-52) – (-36)

**(d)** 39 + (-240 – (15) …..-399 + 159 + 81

**Answer:**

**(a)** (-8) + (-4) ….. (-8) – (-4)

We have,

(-8) + (-4)

= -12

Also,

(-8) – (-4)

= -8 + 4

= -4

Hence,

-12 < -4

⇒ (-8) + (-4) < (-8) – (-4)

**(b)** (-3) + 7 – (19) ….. 15 – 8 + (-9)

We have,

(-3) + 7 – (19)

= -22 + 7

= -15

Also,

15 – 8 + (-9)

= 15 – 8 – 9

= 15 – 17

= -2

Hence,

-15 < -2

⇒ (-3) + 7 – (19) < 15 – 8 + (-9)

**(c)** $23 - 41 + 11 \ldots. 23 - 41 - 11$

We have,

$23 - 41 + 11$

$= -18 + 11$

$= -7$

Also,

$23 - 41 = 11$

$= 23 - 52$

$= -29$

Hence,

$-7 > -29$

$23 - 41 + 11 > 23 - 41 - 11$

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

We have,

$39 + (-24) - (15)$

$= 39 - 24 - 15$

$= 39 - 39$

$= 0$

Also,

$36 + (-520 - (-36)$

$= 36 - 52 + 36$

$= 72 - 52$

$= 20$

Hence,

$0 < 20$

$39 + (-24) - 15 < 36 + (-52) - (-36)$

**(e)** $-231 + 79 + 51 \ldots.. - 399 + 159 + 81$

We have,

$-231 + 79 + 51$

$= -231 + 130$

$= -101$

Also,

$-399 + 159 + 81$

$= -399 + 240$

$= -159$

Hence,

$-101 > -159$

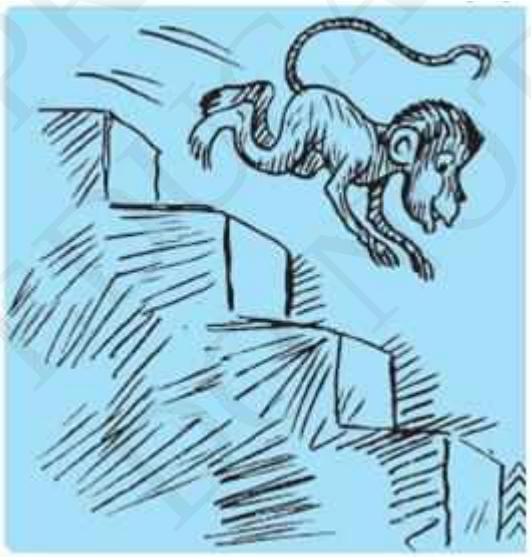
$-231 + 79 + 51 > -399 + 159 + 81$

**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: $-3 + 2 - \ldots\ldots = -8$ ; $4 - 2 + 4 - 2 \ldots\ldots = 8$. In (a), the sum (-8) represents going down by eight steps. So, what will the sum 8 in (b) represent?



**Answer:**

**(i)** Let us assume, down moved steps be represented by positive whereas up moved steps be represented by negative integers

It is given that,

Initially the monkey will be at step = 1

After the 1st jump monkey's step = 1 + 3 = 4
After the 2nd jump monkey's step = 4 + (-2) = 2
After the 3rd jump monkey's step = 2 + 3 = 5
After the 4th jump monkey's step = 5 + (-2) = 3
After the 5th jump monkey's step = 3 + 3 = 6
After the 6th jump monkey's step = 6 + (-2) = 4
After the 7th jump monkey's step = 4 + 3 = 7
After the 8th jump monkey's step = 7 + (-2) = 5
After the 9th jump monkey's step = 5 + 3 = 8
After the 10th jump monkey's step = 8 + (-2) = 6
After the 11th jump monkey's step = 6 + 3 = 9
Hence,
From above results it is clear that the monkey will be at water level i.e., 9 after 11 jumps

**(ii)** From above, we have
Initial step of monkey = 9
Therefore,
After the 1st jump monkey's step = 9 + (-4) = 5
After the 2nd jump monkey's step = 5 + 2 = 7
After the 3rd jump monkey's step = 7 + (-4) = 3
After the 4th jump monkey's step = 3 + 2 = 5
After the 5th jump monkey's step = 5 + (-4) = 1
Hence,
It is clear from the above results is that after 5 jumps the monkey will reach back at the top

**(iii)** If we will represent the down steps by negative and up steps by positive than the moves are as follows:
We have,
Moves in (i):
$- 3 + 2 - 3 + 2 - 3 + 2 - 3 + 2 - 3 + 2 - 3 = 8$
Also,
Moves in part (ii):
$4 - 2 + 4 - 2 + 4 = 8$
Therefore,
Moves in part (ii) shows those steps who moves up.

# Exercise 1.2

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

(a) Sum is – 7

(b) Difference is – 10

(c) Sum is 0

**Answer:**

**(a)** It is given in the question that,

Sum = -7

Therefore,

Pair of integers having sum – 7 is as follows:

- 8 + (1) = -7

**(b)** It is given in the question that,

Difference = -10

Therefore,

Pair of integers having the difference – 10 is as follows:

-12 – (-2)

= - 12 + 2

= - 10

**(c)** It is given in the question that,

Sum = 0

Therefore,

Pair of integers having sum 0 is as follows:

4 + (-4) = 0

**2.**

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

**Answer:**

It is given in the question that,

Difference = 8

Therefore,

Pair of negative integers having difference 8 is as follows:

-2 – (-10)

= - 2 + 10

= 8

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

**Answer:**

It is given in the question that,

Sum = - 5

Therefore,

Negative integer and positive integer having sum – 5 is as follows:

- 8 + (3) = - 5

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

**Answer:**

It is given in the question that,

Difference = - 3

Therefore,

Negative integer and positive integer having difference – 3 is as follows:

- 2 – (1)

= - 2 – 1

= - 3

So the two integers are -2 and 1 respectively.

**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?

**Answer:**

It is given in the question that,

Scores of Team A = - 40, 10, 0

Therefore,

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

= -30

Also,

Scores of Team B = 10, 0, - 40

Therefore,

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

= 10 – 40

= -30

Hence,

It is clear from the above results that the scores of both teams are equal.

Yes, we can also add integers in any order.

As in the above case scores of both, the teams are equal in numerical terms but different in order.

**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] + ……

**Answer:**

**(i)** We have,

(-5) + (-8) = (-8) + (…..)

By the commutative property a + b = b + a

We have,

(-5) + (-8) = (-8) + (-5)

**(ii)** We have,

- 53 + (…..) = - 53

As we know 0 is the number which is added to a number to give the same number.

So,

- 53 + (0) = - 53

**(iii)** We have,

17 + (…..) = 0

answer should be zero, and we know if we add the negative of the number itself it will give zero,

So,

17 + (-17) = 0

**(iv)** We have,

[13 + (-12)] + (…..) = 13 + [(-12) + (-7)]

By associative property (a + b) + c = a + (b + c)

We have,

[13 + (-12)] + (-7) = 13 + [(-12) + (-7)]

**(v)** We have,

(-4) + [15 + (-3)] = [(-4) + 15] + (…..)

By associative property (a + b) + c = a + (b + c)

We have,

(-4) + [15 + (-3)] = [(-4) + 15] + (-3)

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

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

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

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

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

**Answer:**

**(a)** We have,

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

**(b)** We have,

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

**(c)** We have,

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

$= 630$

**(d)** We have,

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

$= 316$

**(e)** We have

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

$= 0 \times 270$

$= 0$

**(f)** We have,

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

$= 12 \times -110$

$= -1320$

**(g)** We have,

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

$= -27 \times -6$

$= 162$

**(h)** We have,

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

$= 90 \times -4$

$= -360$

**(i)** We have,

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

$= 2 \times -12$

$= -24$

**(j)** We have,

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

$= 18 \times 2$

$= 36$

**2.** Verify the following

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

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

**Answer:**

(a) We have,

L.H.S $= 18 \times [7 + (-3)]$

$= 18 \times [7 - 3]$

$= 18 \times [4]$

$= 72$

Also, we have:

R.H.S $= [18 \times 7] + [18 \times (-3)]$

$= 126 + (-54)$

$= 126 - 54$

$= 72$

Therefore,

L.H.S = R.H.S

**Hence,**

$\mathbf{18 \times [7 + (-3)] = [18 \times 7] + [18 \times (-3)]}$

**(b)** We have,

L.H.S $= (-21) \times [(-4) + (-6)]$

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

$= (-21) \times (-10)$

$= 210$

Also, we have:

R.H.S $= [(-21) \times (-4) + [(-21) \times (-6)]$

$= 84 + 126$

$= 210$

Also, we have:

R.H.S $= \left[[(-21) \times (-4)] + \left[(-21) \times (-6)\right)\right]$

$= [21 \times 4] + [21 \times 6]$

$= 84 + 126$

$= 210$

Therefore,

L.H.S = R.H.S

Hence,

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

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

**3.**

(A) For any integer a, what is (-1) × a equal to?

**Answer:**

If we look the question then there will be three possible cases for this question:

**Case 1:** When a is any integer

So,

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

**Case 2:** When a is any negative integer

So,

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

Also,

**Case 3:** When a is 0

So,

$(-1) \times 0 = 0$

Therefore,

From the above results, the possible answers are a, 0 and – a.

(B) Determine the integer whose product with (-1) is
(a) – 22
(b) 37
(c) 0

Answer:

(a) We have,
$22 \times (-1) = -22$

(b) We have,
$-37 \times (-1) = 37$

(c) We have,
$0 \times (-1) = 0$

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

**Answer:**

In this question, we have

$-1 \times 5 = -5$

$-1 \times 4 = -4 = -5 + 1$

$-1 \times 3 = -3 = -4 + 1$

$-1 \times 2 = 2 = -3 + 1$

$-1 \times 1 = -1 = -2 + 1$

$-1 \times 0 = 0 = -1 + 1$

Therefore,

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

**5.** Find the product, using suitable properties:

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

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

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

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

(e) $625 \times (-350 + (-625) \times 65$

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

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

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

**Answer:**

**(a)** We have,

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

We know that,

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

Also,

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

Therefore,

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

$= (-48)[26 + (-36)]$

$= (-48)[26 - 36]$

$= (-48)[-10]$

$= 480$

**(b)** We have,

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

We know that,

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

Also,

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

Therefore,

$= 8 \times [53 \times (-125)]$
$= 8 \times [(-125) \times 53]$
$= [8 \times (-125)] \times 53$
$= [-1000] \times 53$
$= -53000$

**(c)** We have,
$15 \times (-25) \times (-4) \times (-10)$
Therefore,
$= 15 \times [(-25) \times (-4)] \times (-10)$
$= 15 \times (100) \times (-10)$
$= 15 \times (-1000)$
$= -15000$

**(d)** We have,
$(-41) \times 102$
We know that,
$a \times (b + c) = (a \times b) + (a \times c)$
Therefore,
$= (-41) \times (100 + 2)$
$= (-41) \times 100 + (-41) \times 2$
$= -4100 - 82$
$= -4182$

**(e)** We have,
$625 \times (-35) + (-625) \times 65$
We know that,
$(a \times b + a \times c) = a(b + c)$
Therefore,
$= 625 \times [(-35) + (-65)]$
$= 625 \times [-100]$
$= -62500$

**(f)** We have,
$7 \times (50 - 2)$
We know that,
$a \times (b - c) = (a \times b) - (a \times c)$
Therefore,

$= (7 \times 50) - (7 \times 2)$
$= 350 - 14$
$= 336$

**(g)** We have,
$(-17) \times (-29)$
We know that,
$a \times (b + c) = (a \times b) + (a \times c)$
Therefore,
$= (-17) \times [-30 + 1]$
$= [(-17) \times (-30)] + [(-17) \times 1]$
$= [510] + [-17]$
$= 493$

**(h)** We have,
$(-57) \times (-19) + 57 = 57 \times 19 + 57$
We know that,
$(a \times b) + (a \times c) = a(b + c)$
Therefore,
$= 57 \times 19 + 57 \times 1$
$= 57[19 + 1]$
$= 57 \times 20$
$= 1140$

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

**Answer:**

(a) It is given in the question that,
Initial temperature $= 40℃$
Also,
Change in temperature per hour $= -5℃$
Therefore,
Change in temperature after 10 hours = (-5) × 10
$= -50℃$
Hence,

Final temperature = $40°C + (-50°C)$

$= -10°C$

**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?

**Answer:**

**(i)** It is given in the question that,

Marks given to students for 1 correct answer = 5

Therefore,

Marks given to students for 4 correct answers = 5 × 4

= 20

Also,

Marks given to students for 1 wrong answer = - 2

Therefore,

Marks given to students for 6 wrong answers = - 2 × 6

= -12

Hence,

Marks obtained by Mohan = 20 – 12

= 8

**(ii)** It is given in the question that,

Marks given to students for 1 correct answer = 5

Therefore,

Marks given to students for 5 correct answers = 5 × 5

= 25

Also,

Marks are given to students for 1 wrong answer = - 2

Therefore,

Marks given to students for 5 wrong answers = - 2 × 5

= -10

Hence,

Marks obtained by Reshma = 25 – 10

= 15

**(iii)** It is given in the question that,

Marks given to students for 1 correct answer = 5

Therefore,

Marks given to students for 2 correct answers = 5 × 2

= 10

Also,

Marks given to students for 1 wrong answer = - 2

Therefore,

Marks given to students for 5 wrong answers = - 2 × 5

= -10

Hence,

Marks obtained by Heena = 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 sod is 6,400 bags?

**Answer:**

**(a)** In the question profit is denoted by a positive integer whereas loss is denoted by a negative integer

It is given in the question that:

Profit earned while selling 1 bag of white cement = Rs 8

Therefore,

Profit earned while selling 3000 bags of white cement = 8 × 3000

= Rs 24000

Also,

Loss during selling 1 bag of grey cement = Rs – 5

Therefore,

Loss during 5000 bags of grey cement = -5 × 5000

= - 25000

Hence,

Total profit or loss earned by the company = Profit + Loss

= 24000 + (-25000)

= - 1000

Hence,

A loss of Rs 1000 is being incurred by the company

**(b)** It is given in the question that,

Loss during selling 1 bag of grey cement = Rs – 5

Therefore,

Loss during 6400 bags of grey cement = -5 × 6400

= -32000

Let the number of bags of white cement to be sold be x

It is also given that,

Profit earned while selling 1 bag of white cement = Rs 8
Therefore,
Profit earned while selling x bags of white cement = x × 8
= 8x
For having a condition of no profit and no loss, we have:
Profit + Loss = 0
8x + (-32000) = 0
8x = 32000
$x = \frac{32000}{8}$
Therefore, 4000 bags of white cement must be sold.

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

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

Answer:

**(a)** We have,
$(-3) \times (\ldots.) = 27$
So,
$(-3) \times (-9) = 27$

**(b)** We have,
$5 \times (\ldots.) = -35$
So,
$5 \times (-7) = -35$

**(c)** We have,
$(\ldots.) \times (-8) = -56$
So,
$7 \times (-8) = -56$

**(d)** We have,
$(\ldots.) \times (-12) = 132$
So,
$(-11) \times (-12) = 132$

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

**Answer:**

**(a)** We have,

$(-30) \div 10$

$= -\frac{30}{10}$

$= -3$

**(b)** We have,

$50 \div (-5)$

$= \frac{50}{-5}$

$= -10$

**(c)** We have,

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

$= \frac{-36}{-9}$

$= 4$

**(d)** We have,

$(-49) \div 49$

$= \frac{-49}{-49}$

$= -1$

**(e)** We have,

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

$= 13 \div [-2 + 1]$

$= 13 \div (-1)$

$= \frac{13}{-1}$

$= -13$

**(f)** We have,

$0 \div (-12)$

$= \frac{0}{-12}$

$= 0$

**(g)** We have,

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

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

$= (-31) \div (-31)$

$= 1$

**(h)** We have,

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

$= \div 3$

$= (-3) \div 3$

$= \frac{-3}{3}$

$= -1$

**(i)** We have,

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

$= [-6 + 5] \div [-2 + 1]$

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

$= \frac{-1}{-1}$

$= 1$

**2.** Verify that $a \div (b + c)$ $(a \div b) + (a \div c)$ 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:**

**(a)** It is given in the question that,

a = 12

b = - 4

And,

c = 2

We have to verify: $a \div (b + c) \neq (a \div b) + (a \div c)$

Now,

$a \div (b + c)$

$= 12 \div (- 4 + 2)$

$= 12 \div (-2)$

$= \frac{12}{-2}$

$= - 6$

Also,

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

$= [12 \div (- 4)] + [12 \div 2]$

$= \frac{12}{-4} + \frac{12}{2}$

$= - 3 + 6$

$= 3$

Therefore,

$- 6 \neq 3$

Hence,

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

Verified

**(b)** It is given in the question that,

a = (-10)

b = 1

And,

c = 1

We have to verify: $a \div (b + c) \neq (a \div b) + (a \div c)$

Now,

$a \div (b + c)$

$= (-10) \div (1 + 1)$

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

$= -5$

Also,

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

$= [(-10) \div 1] + [(-10) \div 1]$

$= \frac{-10}{1} + \frac{-10}{1}$

$= -10 + (-10)$

$= -10 - 10$

$= - 20$

Therefore,

$- 5 \neq - 20$

Hence,

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

Verified

**3.** Fill in the blanks:

(a) $369 \div$ _____ $= 369$

(b) $(–75) \div$ _____ $= –1$

(c) $(–206) \div$ _____ $= 1$

(d) $– 87 \div$ _____ $= 87$

(e) _____ $\div 1 = – 87$

(f) _____ $\div 48 = – 1$

(g) $20 \div$ _____ $= – 2$

(h) _____ $\div (4) = – 3$

**Answer:**

**(a)** We have,

$369 \div ……. = 369$

So,
$369 \div 1 = 369$

**(b)** We have,
$(-75) \div \ldots\ldots = -1$
So,
$(-75) \div 75 = -1$

**(c)** We have,
$(-206) \div \ldots\ldots = 1$
So,
$(-206) \div (-206) = 1$

**(d)** We have,
$-87 \div \ldots.. = 87$
So,
$-87 \div (-1) = 87$

**(e)** We have,
$\ldots\ldots \div 1 = -87$
So,
$(-87) \div 1 = -87$

**(f)** We have,
$\ldots\ldots \div 48 = -1$
So,
$(-48) \div 48 = -1$

**(g)** We have,
$20 \div \ldots\ldots = -2$
So,
$20 \div (-10) = -2$

**(h)** We have,
$\ldots\ldots \div (4) = -3$
So,
$(-12) \div (4) = -3$

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

**Answer:**

Five such pairs are as follows:

**(a)** (3, - 1)
This is because,
3 ÷ (-1) = - 3

**(b)** (-3, 1)
This is because,
(-3) ÷ 1 = - 3

**(c)** (9, - 3)
This is because,
9 ÷ (-3) = - 3

**(d)** (-9, 3)
This is because,
(-9) ÷ 3 = - 3

**(e)** (12, - 4)
This is because,
12 (- 4) = - 3

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

**Answer:**

**Method 1:**

Given: Temperature at 12 noon $= 10°C$

Change in temperature per hour $= -2°C$

To Find: Time at which temperature is 8ºC below zero = -8ºC.

Temperature Difference = -8 -10 = -18ºC.

-2ºC change is in 1 hour1ºC change will be in 1/2 hour.18ºC change will be in 1/2 × 18 hours.18ºC change will be in 9 hours. So, the time at which the temperature is -8ºC = 12 noon + 9 hours = 9 p.m. Now, temperature at 12 midnight = 12 noon + 12 hours Therefore, we need

to find a change in temperature in 12 hours. In 1-hour change is -2ºC, in 12 hours change will be 12 × -2ºC = -24ºC.

So, the temperature at midnight = 10ºC – 24ºC = 14℃

**Method 2:** Given: Temperature at 12 noon = 10℃

Change in temperature per hour = −2℃

Therefore,

Temperature at 1:00 PM = 10℃ + (−2℃) = 8℃

Temperature at 2:00 PM = 8℃ + (−2℃) = 6℃

Temperature at 3:00 PM = 6℃ + (−2℃) = 4℃

Temperature at 4:00 PM = 4℃ + (−2℃) = 2℃

Temperature at 5:00 PM = 2℃ + (−2℃) = 0℃

Temperature at 6:00 PM = 0℃ + (−2℃) = −2℃

Temperature at 7:00 PM = −2℃ + (−2℃) = −4℃

Temperature at 8:00 PM = −4℃ + (−2℃) = −6℃

Temperature at 9:00 PM = −6℃ + (−2℃) = −8℃

Hence,

The temperature will be 8℃ below zero at 9:00 PM

Now,

Change in temperature in 12 hours = −2℃ × 12

= −24℃

Also,

At midnight the temperature will be = 10 + (-24)

= −14℃

Hence,

The temperature at midnight will be 14℃ below zero.

**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:**

**(i)** It is given in the question that,

Marks given for every correct answer = +3

And,

Marks given for every wrong answer = - 2

Also, it is given that:

Marks obtained by Radhika = 20

Correct answer = 12

Therefore,

Marks obtained for correct answers = 12 × 3

= 36

Hence,

Marks obtained for incorrect answers = Total marks – Marks obtained for correct answers

= 20 – 36

= -16

As, marks obtained for 1 wrong answer = - 2

Hence,

Number of incorrect answers $= \frac{-16}{-2}$

= 8

**(ii)** It is given in the question that,

Marks given for every correct answer = +3

And,

Marks given for every wrong answer = - 2

Also, it is given that:

Marks obtained by Mohini = - 5

Correct answer = 7

Therefore,

Marks obtained for correct answers = 7 × 3

= 21

Hence,

Marks obtained for incorrect answers = Total marks – Marks obtained for correct answers

= -5 – 21

= -26

As, marks obtained for 1 wrong answer = - 2

Hence,

Number of incorrect answers $= \frac{-26}{-2}$

= 13

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

**Answer:**

In the above question the distance descended is denoted by a negative integer

It is given in the question that,

Initial height = 10 m

Also,

Final depth = $-350$ m

Therefore,

Total distance to be descended by the elevator = $(-350) - (10)$

= $-360$ m

Also,

Time taken by the elevator to descend $-6$m = 1 minute

Hence,

Time taken by the elevator to descend $-360$ m =

= 60 minutes

= 1 hour