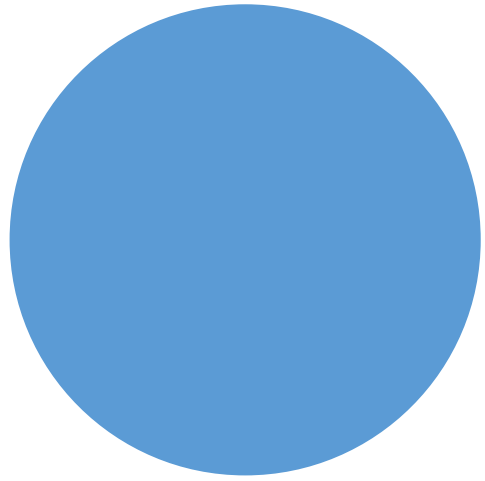


Integers

Class 7 Chapter 1

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DAY - 1

Introduction

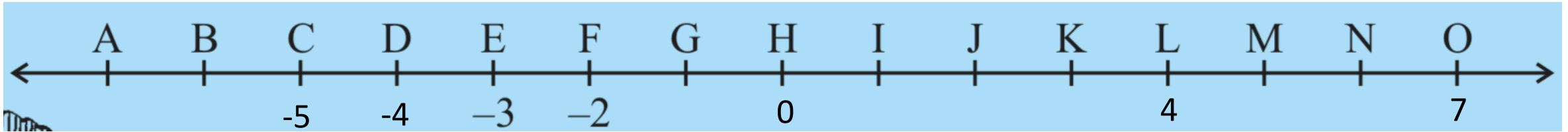
- We know that integers form a *bigger* collection of numbers which contains whole numbers and negative numbers.
- What other differences do you find between whole numbers and integers?
- In this chapter, we will study more about integers, their properties and operations.

Recall

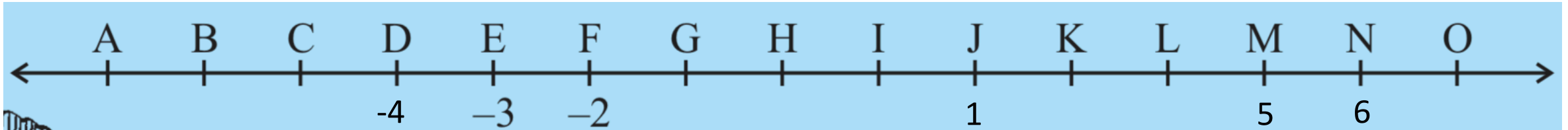


- Can you write these marked integers in ascending order ?
 - The ascending order of these numbers is $-5, -1, 3$.
 - Why did we choose -5 as the smallest number?
- When we move left to right on a number line , the number will increase.

Recall...



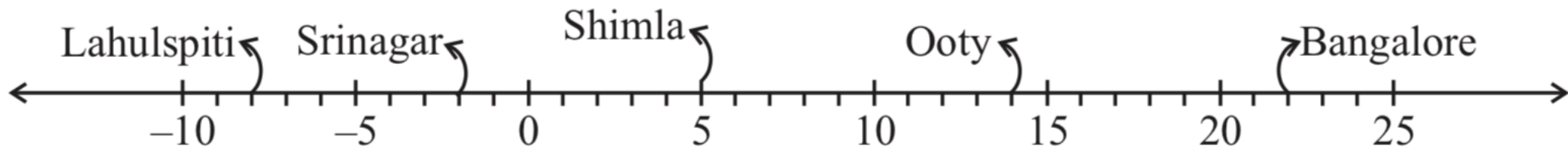
- Arrange 7, -5, 4, 0 and -4 in ascending order and then mark them on a number line to check your answer.



- Similarly if we move from right to left the number will decrease.
 - Now can you arrange the given number in decreasing order 6, -4, 5, -2, 1.
 - Ans. 6, 5, 1, -2, -4

Exercise 1.1

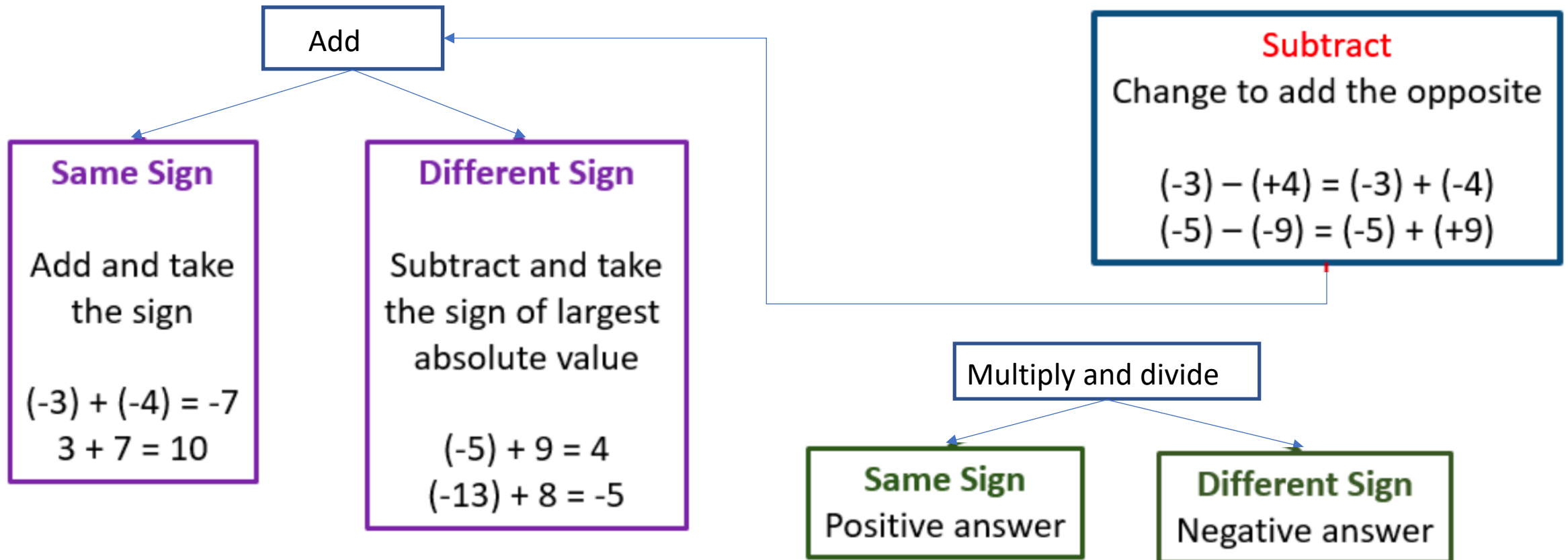
1. Following number line shows the temperature in degree celsius ($^{\circ}\text{C}$) at different places on a particular day.



- (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?

DAY - 2

Rules of Integers



Exercise 1.1

Question2: 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?

Solution :

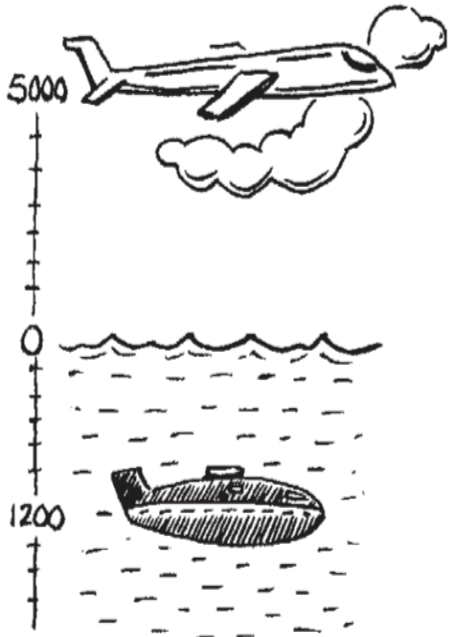
Jack's scores in five successive rounds are 25, -5 , -10 , 15 and 10.

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

Thus, 35 marks got by Jack in the quiz.

Exercise 1.1

Question3: 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?



Solution : Height of plane above sea level = 5000m

Floating of submarine below sea level = 1200m

Vertical distance between plane and submarine = $5000 + 1200 = 6200$

Thus , vertical distance between plane and submarine is 6200.

Try this

Question : 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?

Additive inverse of Integers

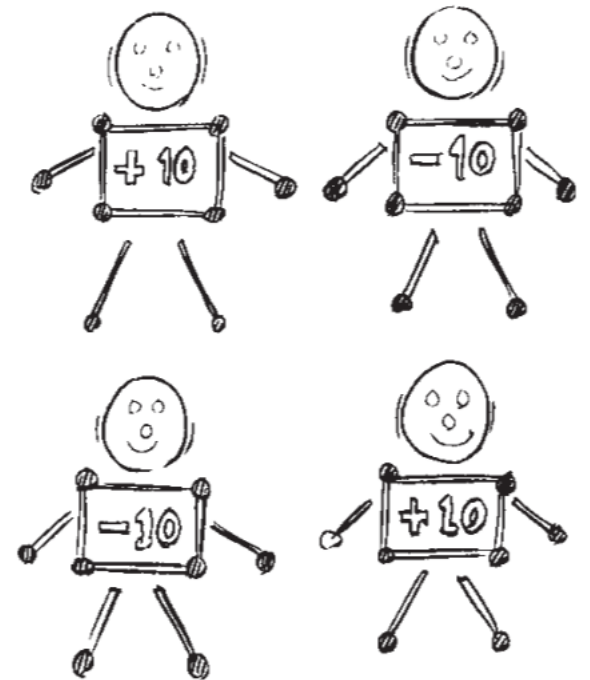
Integer	Additive inverse
10	-10
-10	10
76	-76
-76	76

The additive inverse of any integer a is $-a$ and additive inverse of $(-a)$ is a .

Subtraction is opposite of addition.

Hence, we add the additive inverse of the integer that is being subtracted, to the other integer.

For example: $56 - 73 = 56 + \text{additive inverse of } 73 = 56 + (-73) = -17$



Try these

Question : We have done various patterns with numbers in our previous class. Can you find a pattern for each of the following? If yes, complete them:

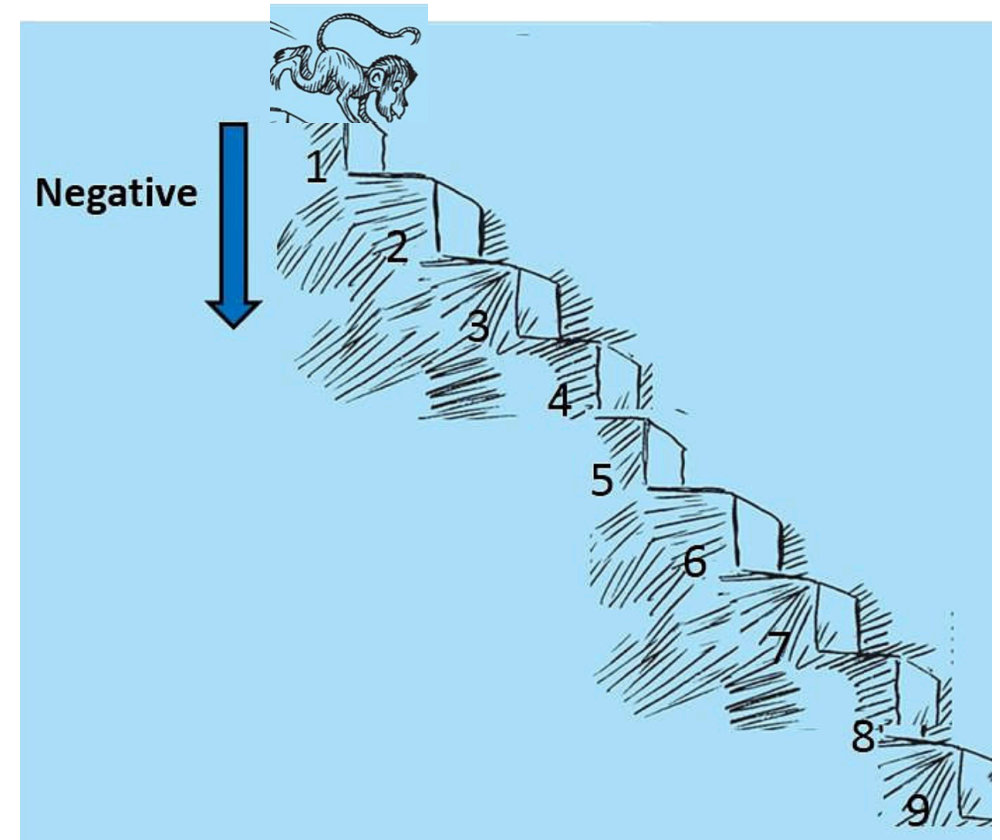
- 1.(a) $7, 3, -1, -5, \underline{\hspace{1cm}}, \underline{\hspace{1cm}}, \underline{\hspace{1cm}}.$
- 2.(b) $-2, -4, -6, -8, \underline{\hspace{1cm}}, \underline{\hspace{1cm}}, \underline{\hspace{1cm}}.$
- 3.(c) $15, 10, 5, 0, \underline{\hspace{1cm}}, \underline{\hspace{1cm}}, \underline{\hspace{1cm}}.$
- 4.(d) $-11, -8, -5, -2, \underline{\hspace{1cm}}, \underline{\hspace{1cm}}, \underline{\hspace{1cm}}.$

Make some more such patterns and ask your friends to complete them.

Exercise 1.1, 10

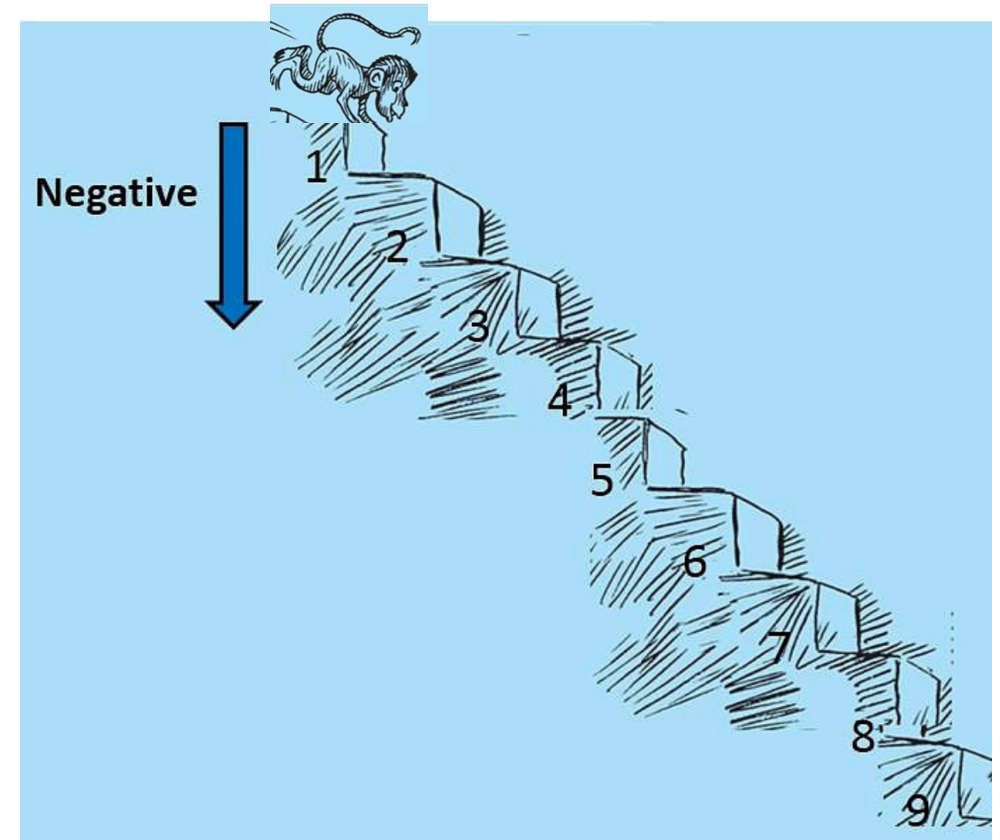
Question : A water tank has steps inside it. A monkey is sitting on the topmost step (i.e., first step). The water level is at the ninth step.

- (i) He jumps 3 steps down and then jumps back 2 steps up. In how many jumps will he reach the water level?



Exercise 1.1, 10 - Solution

Jump		Total Steps moved	Current position
Start			1 st Step
1 st Jump	3 steps down	-3	4 th Step
2 nd Jump	2 steps up	$-3 + 2 = -1$	2 nd Step
3 rd Jump	3 steps down	$-1 - 3 = -4$	5 th Step
4 th Jump	2 steps up	$-4 + 2 = -2$	3 rd Step
5 th Jump	3 steps down	$-2 - 3 = -5$	6 th Step
6 th Jump	2 steps up	$-5 + 2 = -3$	4 th Step
7 th Jump	3 steps down	$-3 - 3 = -(3 + 3) = -6$	7 th Step
8 th Jump	2 steps up	$-6 + 2 = -4$	5 th Step
9 th Jump	3 steps down	$-4 - 3 = -7$	8 th Step
10 th Jump	2 steps up	$-7 + 2 = -5$	6 th Step
11 th Jump	3 steps down	$-5 - 3 = -8$	9 th Step

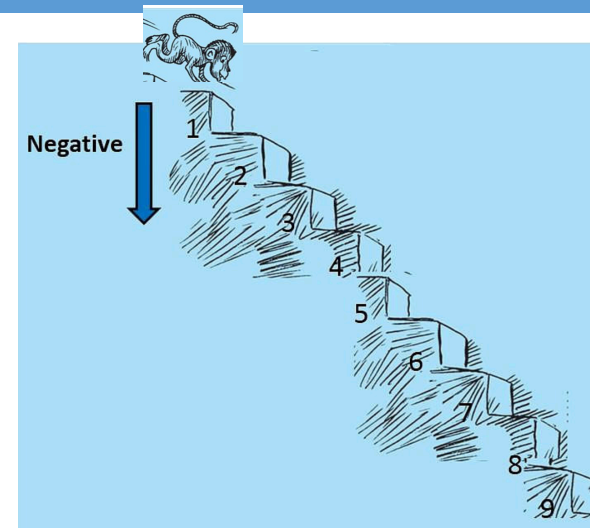


Exercise 1.1, 10 – for students

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

(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?



DAY - 3

Properties of addition and subtraction of integer

Property 1: Closure Property

The **closure property** states that **sum, difference** and **multiplication** of integer is always an integer. which means if x and y are two integers then

$$x + y \in \mathbb{Z}$$

$$x - y \in \mathbb{Z}$$

$$x \times y \in \mathbb{Z} \quad [\text{where } \mathbb{Z} \text{ is an integer}] \quad - \text{We'll look upon multiplication in later slides.}$$

Example of Sum:

$$3 - 4 = 3 + (-4) = -1$$

$$(-5) + 8 = 3$$

The results are integers

Properties of addition and subtraction of integer

Let us check closure property for

Addition

Statement	Observation
(i) $17 + 23 = 40$	Result is an integer
(ii) $(-75) + 18 = -57$	Result is an integer
(iii) $27 + (-27) = 0$	Result is an integer
(iv) $(-20) + 0 = -20$	Result is an integer
(v) $(-35) + (-10) = -45$	Result is an integer

Let us check closure property for

Subtraction

Statement	Observation
(i) $7 - 9 = -2$	Result is an integer
(ii) $17 - (-21) = 38$	Result is an integer
(iii) $(-8) - (-14) = 6$	Result is an integer
(iv) $32 - (-17) = 49$	Result is an integer
(v) $(-29) - 0 = -29$	Result is an integer

Properties of addition and subtraction of integer

Property 2: Commutative Property

The commutative property of addition states that the order of terms doesn't matter, the result will be the same. In **addition** swapping of terms will not change the sum. Suppose x and y are any two integers, then

$$\Rightarrow x + y = y + x$$

Example :

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

$$10 \times (-3) = -30 = (-3) \times 10$$

But, **subtraction** ($x - y \neq y - x$) is not commutative for integers and whole numbers.

Example :

$$4 - (-6) = 10 ; (-6) - 4 = -10$$

$$\Rightarrow 4 - (-6) \neq (-6) - 4$$

Is $5 - (-3) = -3 - 5$?

Try these

Identify whether following statements are True/False –

(i) $(-8) + (-9) = (-9) + (-8)$

(ii) $(-23) + 32 = 32 + (-23)$

(iii) $(-45) + 0 = 0 + (-45)$

DAY - 4

Properties of addition and subtraction of integer

Property 3: Associative Property

The associative property of **addition** states that the way of grouping of numbers doesn't matter, the result will be same. One can group numbers in any way but the answer will remain same.

Let x , y and z be any three integers, then

$$\Rightarrow x + (y + z) = (x + y) + z$$

Example: $1 + (2 + (-3)) = 0 = (1 + 2) + (-3)$

Subtraction of integers is not associative in nature i.e. $x - (y - z) \neq (x - y) - z$.

Example: $1 - (2 - (-3)) = -4; (1 - 2) - (-3) = -2$

$$1 - (2 - (-3)) \neq (1 - 2) - (-3)$$

Consider the following integers -3, -2 and -5

Is $(-5) + [(-3) + (-2)]$ equals to $[(-5) + (-3)] + (-2)$?

Additive Identity

Additive Identity

Among the various properties of integers, additive identity property states that when any integer is added to zero it will give the same number. Zero is called additive identity.

For any integer x ,

$$x + 0 = x = 0 + x$$

Observe the following and fill in the blanks:

(i) $(-8) + 0 = -8$

(ii) $(-23) + 0 = \underline{\hspace{2cm}}$

(iii) $0 + (-59) = \underline{\hspace{2cm}}$

(iv) $-61 + \underline{\hspace{2cm}} = -61$

(v) $0 + (-8) = -8$

(vi) $0 + (-37) = -37$

(vii) $0 + \underline{\hspace{2cm}} = -43$

Try these

Write down a pair of integers whose

a) sum is -7

$$(-8) + 1 = -7 \quad \text{or} \quad 7 + (-14) = -7$$

b) Sum is 0

$$(-7) + 7 = 0 \quad \text{or} \quad (-1) + 1 = 0$$

c) Difference is 8

$$14 - 6 = 8 \quad \text{or} \quad (-11) - (-19)$$

Exercise 1.2 – for students

1.
 - (a) Write down a pair of integers whose difference is -10
 - (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.
2. 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?
3. 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) $(-4) + [\dots\dots\dots + (-3)] = [\dots\dots\dots + 15] + \dots\dots\dots$

Multiplication of integers

Multiplication of positive and negative integer: while multiplying a positive integer and a negative integer we multiply them as whole number and put a (-) sign before the product.

For example:

$$4 \times (-8) = -32$$

$$(-7) \times 22 = -154$$

Multiplication of two negative integers: while multiplying two negative integers we multiply two negative integers as whole number and put the positive sign before the product.

In general for any two positive integers a and b,

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

For example: $(-10) \times (-14) = 140$

Try these –

$$15 \times (-16) = ?$$

$$21 \times (-32) = ?$$

$$(-42) \times 12 = ?$$

$$(-55) \times 15 = ?$$

Try these –

$$(-25) \times (-72) = ?$$

$$(-83) \times (-28) = ?$$

Multiplication of integers

Product of three or more negative integers

Observe the following

$$(-1) \times (-1) = +1 \text{ Positive}$$

$$(-1) \times (-1) \times (-1) = -1 \text{ Negative}$$

$$(-1) \times (-1) \times (-1) \times (-1) = +1 \text{ Positive}$$

$$(-1) \times (-1) \times (-1) \times (-1) \times (-1) = -1 \text{ Negative}$$

Example : $(-9) \times (-5) \times (-6) \times (-3) = 810$.

But $(-9) \times (-5) \times 6 \times (-3) = -810$ **why ?**

- If the number of negative integers in a product is even, then the product is a positive integer;*
- If the number of negative integers in a product is odd, then the product is a negative integer.*

Conclusion :

1. If the integer (-1) is multiplied even number of times, the product is $+1$.
2. If the integer (-1) is multiplied odd number of times, the product is -1 .

What will be the sign of product if we multiply together:

- i. 8 negative integers and 3 positive integers ?
- ii. 5 negative integers and 4 positive integers ?

Exercise 1.3 – for students

Find product of following numbers ?

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

Properties of multiplication of integer

Closure Property

The **closure property** states that **multiplication** of integer is always an integer. which means if x and y are two integers then

$$x \times y \in Z \quad [\text{where } Z \text{ is an integer}]$$

Example : $6 \times 9 = 54$; $(-5) \times (3) = -15$, which are integers

Example : $(-3) \div (-6) = \frac{1}{2}$ is not an integer. What does it mean?

Division of integers doesn't follow the closure property.

Properties of multiplication of integer

Commutative property of multiplication

It states that the order of terms doesn't matter, the result will be the same.

for any integers a and b.

$$a \times b = b \times a$$

Example: $3 \times (-4) = -4 \times 3 = -12$

$(-15) \times (-10) = (-10) \times (-15) = ?$

Associative property of multiplication

The product of three integers does not depend upon the grouping.

for any three integers a, b and c.

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

Example: $(3 \times 2) \times 5 = 3 \times (2 \times 5)$

check it for 7, 6, -4 ?

Multiplication by zero: for any integer a,

$$a \times 0 = 0 \times a = 0$$

$$-3 \times 0 = ?$$

Multiplicative Identity: for any integer a.

$$a \times 1 = 1 \times a = a$$

$$-6 \times 1 = -6$$

$$8 \times 1 = ?$$

We get additive inverse of an integer a when we multiply (-1) to a, i.e. $a \times (-1) = (-1) \times a = -a$

Example :

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

$$13 \times (-1) = -13$$

Properties of multiplication of integer

Property 4: Distributive Property

The distributive property explains the distributing ability of operation over another mathematical operation within a bracket.

1. It can be either distributive property of multiplication over addition Or

$$\Rightarrow x \times (y + z) = x \times y + x \times z$$

2. Distributive property of multiplication over subtraction.

$$\Rightarrow x \times (y - z) = x \times y - x \times z$$

Example: $-5 \times (2 + 1) = -15 = (-5 \times 2) + (-5 \times 1)$

Note: We use these properties to make calculation easier.

Making multiplication easier

a) $(-25) \times 37 \times 4$
 $\Rightarrow [(-25) \times 37] \times 4$
 $\Rightarrow (-925) \times 4 = \mathbf{-3700}$

Now try it in a different way

$[(-25) \times 4] \times 37$
 $\Rightarrow (25-100) \times 37$
 $= \mathbf{-3700}$ isn't it easier ?

b) Find: 16×12

16×12 can be written as $16 \times (10 + 2)$

$\Rightarrow 16 \times 10 + 16 \times 2$

$\Rightarrow 160 + 32 = 192$

Question : $(-23) \times 48$

This can be written as $(-23) \times [50-2]$

Now can you solve it ?

d) $52 \times (-8) + (-52) \times 2$

Hint: $(-52) \times 2$ can be written as $52 \times (-2)$.

$\Rightarrow 52 \times (-8) + 52 \times (-2)$

$\Rightarrow 52 \times (-8 - 2) = 52 \times (-10) = -520$

Exercise 1.3 – for students

1. Verify the following :

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

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

2. (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

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

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

DAY - 5

Questions on application of integers

Question: In a class test containing 15 questions, 4 marks are given for every correct answer, (−2) marks are given for every incorrect answer and 0 marks are given for un-attempted questions.

I) Gurpreet attempts all questions but only 9 of her answers are correct. What is her total score?

Marks given for one correct answer = 4

So, marks given for 9 correct answers = $4 \times 9 = 36$

Marks given for one incorrect answer = − 2

So, marks given for $(15-9) = 6$ incorrect answers = $(-2) \times 6 = -12$

Therefore, Gurpreet's total score = $36 + (-12) = 24$

II) If total marks achieved by Gurpreet are 50. How many questions did she attempt ?
How many questions she did not attempt?

Hint : She may give incorrect answer for few questions, as well as she may not attempt a few questions.

Questions on application of integers

Example: 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?

Solution:

Initial Temperature = 40°C

Room temperature decreases at 5°C per hour

$\therefore$ Change in temperature in 1 hour = -5°C

change in temperature in 10 hour = $-5 \times 10 = -50^{\circ}\text{C}$

$\therefore$ Room temperature after 10 hours = initial temperature + temperature change in 10 hour
 $\Rightarrow 40 + (-50) = -10^{\circ}\text{C}$

Questions on application of integers

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?

Solution:

Profit for selling each white cement bag = Rs. 8

Bags of white cement sold by the company = 3,000

Hence profit earned by the company = $3,000 \times 8 =$
Rs.24,000

Loss for selling each grey cement bag = Rs. 5

Bags of grey cement sold by the company = 5,000

Loss incurred by the company = $5,000 \times 5 =$ Rs. 25,000

Profit from white cement = 24,000

Loss from grey cement = 25,000

Overall is it profile or loss ?

Loss of Rs. 1,000

Questions on application of integers

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

(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

Solution :

Total grey cement bags = 6,400. (Given)

Now, the loss incurred by the company = $6,400 \times 5 = 32,000$

⇒ to make the amounts equal, the profit should also be the same.

⇒ the profit is Rs. 32,000

No. of white cement bags = $32,000 \div 8$

That is equal to 4,000

So, the required no. of white cement bags to equal the amount are 4,000

Exercise (for students)

Question1: 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?

Question2: Suppose we represent the distance above the ground by a positive integer and that below the ground by a negative integer, then answer the following:

- (i) An elevator descends into a mine shaft at the rate of 5 metre per minute. What will be its position after one hour?
- (ii) If it begins to descend from 15 m above the ground, what will be its position after 45 minutes?

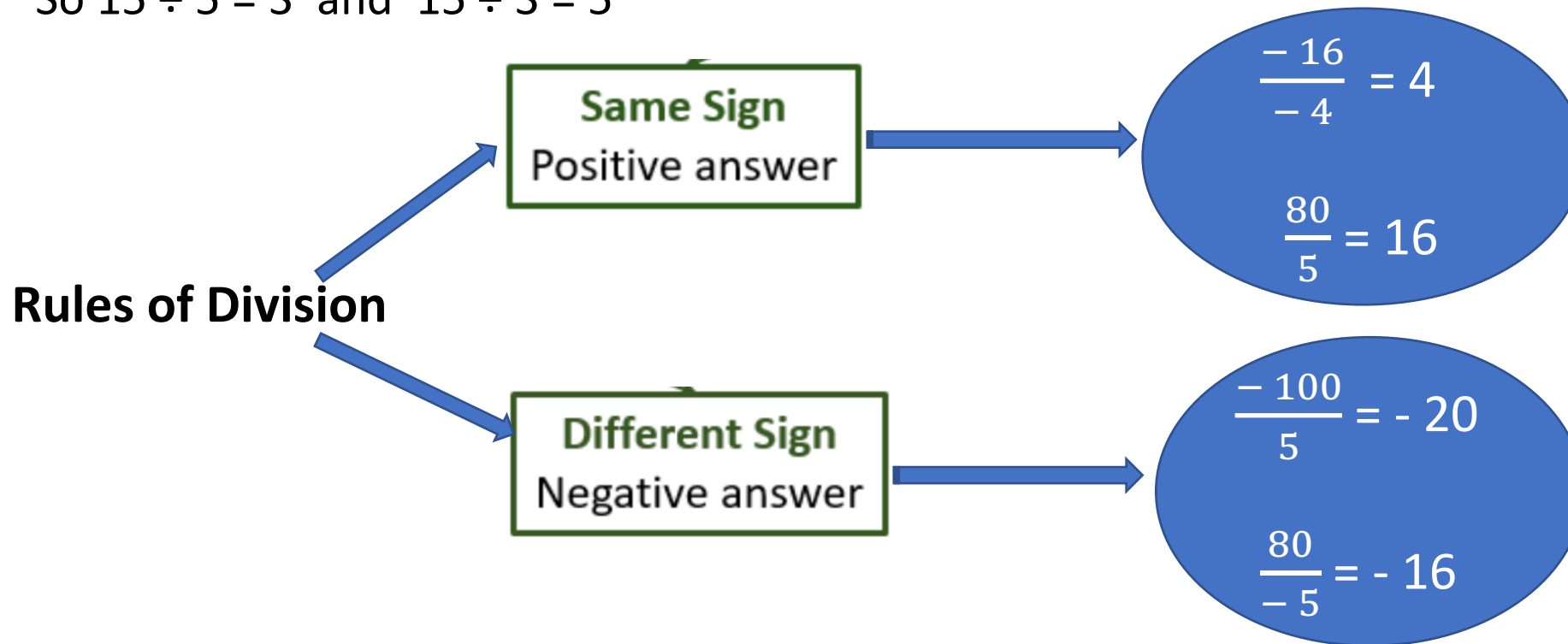
Question3: Replace the blank with an integer to make it a true statement.

- | | |
|---|---|
| (a) $(-3) \times \underline{\hspace{2cm}} = 27$ | (c) $\underline{\hspace{2cm}} \times (-8) = -56$ |
| (b) $5 \times \underline{\hspace{2cm}} = -35.$ | (d) $\underline{\hspace{2cm}} \times (-12) = 132$ |

DAY - 6

Division of integers

- Division is the inverse operation of multiplication. Example for whole numbers.
Since $3 \times 5 = 15$
So $15 \div 5 = 3$ and $15 \div 3 = 5$



Properties of division

Division does **not** follow closure property.

As $\frac{-16}{-4} = 4$ is an integer.

But $\frac{-4}{-16} = \frac{1}{4}$ is not an integer.

Division is **not** commutative under

Division as $\frac{a}{b} \neq \frac{b}{a}$

for example: $\frac{18}{9} = 2$

But, $\frac{9}{18} = \frac{1}{2}$

Properties of division

Role of zero

For any integer a ,

$\frac{a}{0}$ is **NOT DEFINED**.

$\frac{0}{a} = 0$ for $a \neq 0$

Role of one

For any integer a ,

$\frac{a}{1}$ is **a** .

e.g. $\frac{-8}{1} = -8$

Exercise (for students)



Question1: Evaluate each of the following:

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

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

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

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

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

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

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

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

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

Question2: Verify that $a \div (b + c) \neq (a \div b) + (a \div c)$ for each of the following values of a , b and c .

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

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

Question3: Fill in the blanks:

(a) $369 \div \underline{\hspace{2cm}} = 369$

(e) $\underline{\hspace{2cm}} \div 1 = -87$

(b) $(-75) \div \underline{\hspace{2cm}} = -1$

(f) $\underline{\hspace{2cm}} \div 48 = -1$

(c) $(-206) \div \underline{\hspace{2cm}} = 1$

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

(d) $-87 \div \underline{\hspace{2cm}} = 87$

(h) $\underline{\hspace{2cm}} \div (4) = -3$

Question:

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 midnight?

Solution :-

At 12 noon, the temperature = 10°C above zero

8°C below zero = $- 8^{\circ}\text{C}$

$\therefore$ total fall in temperature from 10°C to 0°C and from 0°C to $- 8^{\circ}\text{C}$ = 18°C . [decrease in temp = $10 - (-8) = 18$]

Since the temperature falls 2°C in every one hour

1°C fall in temperature = $\frac{1}{2}$ hour

18°C fall in temperature = $\frac{1}{2} \times 18 = 9$ hour

Present time is 12 noon so, the time when the temperature is $- 8^{\circ}\text{C}$ = 12 noon + 9 hours = 9 pm

At 9 PM, the temperature is $- 8^{\circ}\text{C}$, the temperature at 12 midnight will be

$(- 8^{\circ}\text{C}) + (- 2^{\circ}\text{C} \times 3 \text{ hours})$

= $(- 8^{\circ}\text{C}) + (- 6^{\circ}\text{C}) = - 14^{\circ}\text{C}$

So, at 12 midnight the temperature will be $- 14^{\circ}\text{C}$.

Question:

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?

solution:

Number of correct answer = 12

Marks from correct answers = 12×3 [3 for each correct answer]

Final score of Radhika is 20.

Final score = marks from correct answer + marks from incorrect answer
+ Marks for No attempt

$$20 = 36 + (-2) (\text{no. of incorrect answer}) + 0 (\text{for no attempt})$$

$$20 - 36 = (-2) (\text{no. of incorrect answer})$$

$$- \frac{16}{2} = \text{no of incorrect answers}$$

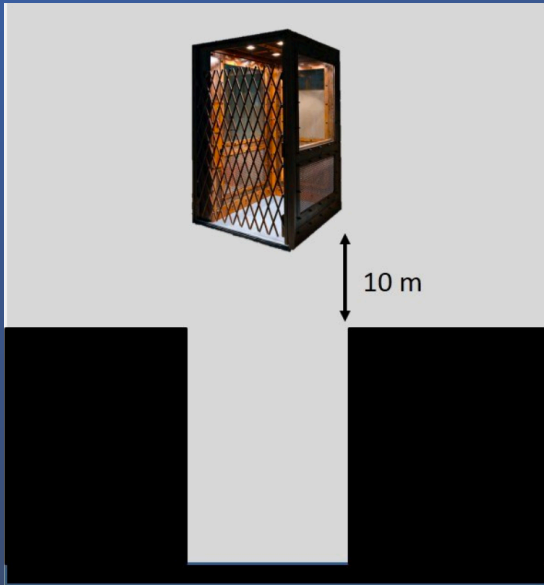
therefore she made $\frac{16}{2} = 8$ incorrect answer.

Try this →

(ii) Mohini scores −5 marks in this test, though she has got 7 correct answers. How many questions has she attempted incorrectly?

Question:

An elevator descends into a 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.



Solution: Considering the elevator to be at constant speed and the destination to be 350 m below ground level,

The elevator has to travel 10m till the ground, then 350 m more below the ground

So, the total distance to travel = 360

elevator's speed = 6 metres /minute,
Then

$$\text{Time} = \frac{\text{Distance}}{\text{Speed}} = \frac{360}{6} = 60 \text{ minutes} = 1 \text{ hour}$$

Thus, the elevator would take 1 hour to reach its destination

Exercise (for students)

Question1: A shopkeeper earns a profit of Re 1 by selling one pen and incurs a loss of 40 paise per pencil while selling pencils of her old stock.

- (i) In a particular month she incurs a loss of Rs 5. In this period, she sold 45 pens. How many pencils did she sell in this period?
- (ii) In the next month she earns neither profit nor loss. If she sold 70 pens, how many pencils did she sell?

Question2: Write five pairs of integers (a, b) such that $a \div b = -3$.

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

What have
we
discussed?

Property	Operations on Integers			
Name	Addition	Subtraction	Multiplication	Division*
Closure	$a + b \in \mathbb{Z}$	$a - b \in \mathbb{Z}$	$a \times b \in \mathbb{Z}$	$a \div b \notin \mathbb{Z}$
Commutative	$a + b = b + a$	$a - b \neq b - a$	$a \times b = b \times a$	$a \div b \neq b \div a$
Associative	$(a + b) + c = a + (b + c)$	$(a - b) - c \neq a - (b - c)$	$(a \times b) \times c = a \times (b \times c)$	$(a \div b) \div c \neq a \div (b \div c)$
Distributive	$a \times (b + c) = ab + ac$	$a \times (b - c) = ab - ac$	Not applicable	Not applicable
where $a, b, c \in \mathbb{Z}$				*b is a non-zero integer

Properties Of Integers