

CHAPTER

6

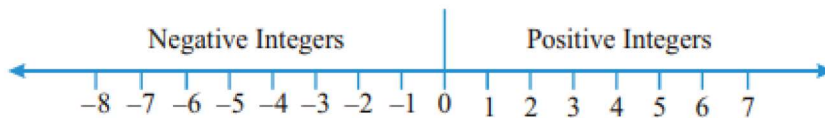
VI-MATHEMATICS-NCERT(2024-25)

6 INTEGERS (Notes)

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<https://sureshmathsmaterial.com/>

- The collection of numbers..., $-4, -3, -2, -1, 0, 1, 2, 3, 4, \dots$ is called integers. So, $-1, -2, -3, -4, \dots$ called negative numbers are negative integers and $1, 2, 3, 4, \dots$ called positive numbers are the positive integers.
- Representation of integers on a number line



- One more than given number gives a successor and one less than given number gives predecessor

Do This 

Write the succeeding number of the following : (Successor= Just After number)

Number	Successor
10	11
8	9
-5	-4
-3	-2
0	1

Now write the preceding number of the following : (Predecessor=Just before number)

Number	Predecessor
10	9
8	7
5	4
3	2
0	-1

Tag me with a sign

Profit and loss are opposite situations and if profit is represented by '+' sign, loss can be represented by '-' sign.

Name of items	Profit	Loss	Representation with proper sign
Mustard oil	₹ 150		₹ 150
Rice		₹ 250	-₹ 250
Black pepper	₹ 225		₹ 225
Wheat	₹ 200		₹ 200
Groundnut oil		₹ 330	-₹ 330

Try These 

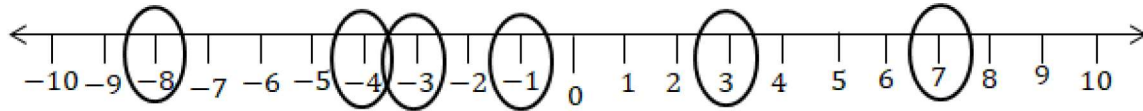
Write the following numbers with appropriate signs :

- 100m below sea level. Ans: **-100m**
- 25°C above 0°C temperature. Ans: **+25°C**
- 15°C below 0°C temperature. Ans: **-15°C**

(d) Any five numbers less than 0 Ans: $-5, -4, -3, -2, -1$

Try These

Mark 3, 7, -4, -8, -1 and -3 on the number line.



4. Fill in the boxes using $>$ and $<$ signs.

$$\begin{array}{l} 0 \quad > \quad -1 \quad \quad -100 \quad > \quad -101 \\ -50 \quad > \quad -70 \quad \quad 50 \quad > \quad -51 \\ -53 \quad < \quad -5 \quad \quad -7 \quad < \quad 1 \end{array}$$

Try These

Compare the following pairs of numbers using $>$ or $<$

$$\begin{array}{l} 0 \quad > \quad -8; \quad -1 \quad > \quad -15 \\ 5 \quad > \quad -5; \quad 11 \quad < \quad 15 \\ 0 \quad < \quad 6; \quad -20 \quad < \quad 2 \end{array}$$

From the above exercise, Rohini arrived at the following conclusions : Do you agree with her? Give examples.

(a) Every positive integer is larger than every negative integer.

Sol: Yes, the positive integers are right to negative integers and every right integer is larger to left integer on number line.

(b) Zero is less than every positive integer.

Sol: Yes, zero is left to all positive integers

(c) Zero is larger than every negative integer.

Sol: Yes, zero is right to all negative integers.

(d) Zero is neither a negative integer nor a positive integer.

Sol: Yes.

(e) Farther a number from zero on the right, larger is its value.

Sol: Yes,

(f) Farther a number from zero on the left, smaller is its value.

Sol: Yes.

Example 1 : By looking at the number line, answer the following questions : Which integers lie between -8 and -2 ? Which is the largest integer and the smallest integer among them?

Solu: Integers between -8 and -2 are $-7, -6, -5, -4, -3$.

The integer -3 is the largest and -7 is the smallest.

Example 2 : (a) One button is kept at -3 . In which direction and how many steps should we move to reach at -9 ?

(b) Which number will we reach if we move 4 steps to the right of -6 .

Solu : (a) We have to move six steps to the left of -3

(b) We reach -2 when we move 4 steps to the right of -6 .

EXERCISE 6.1

1. Write opposites of the following :

(a) Increase in weight

Sol: Decrease in weight

(b) 30 km north

Sol: 30 km south

(c) 80 m east

Sol: 80 m west

(d) Loss of Rs 700

Sol: Profit of Rs 700

(e) 100 m above sea level

Sol: 100 m below sea level

2. Represent the following numbers as integers with appropriate signs.

(a) An aeroplane is flying at a height two thousand metre above the ground.

Sol: $+2000$ m

(b) A submarine is moving at a depth, eight hundred metre below the sea level.

Sol: -800 m

(c) A deposit of rupees two hundred.

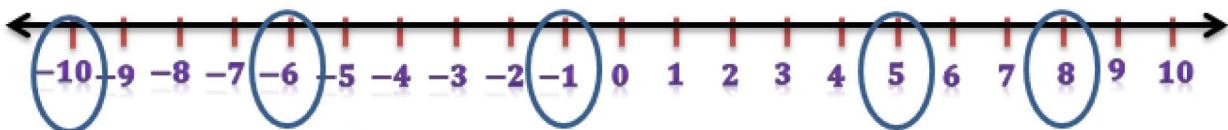
Sol: $+\text{₹}700$

(d) Withdrawal of rupees seven hundred.

Sol: $-\text{₹}700$

3. Represent the following numbers on a number line :

(a) $+5$ (b) -10 (c) $+8$ (d) -1 (e) -6



4. Adjacent figure is a vertical number line, representing integers. Observe it and locate the following points :

(a) If point D is $+8$, then which point is -8 ?

Sol: F

(b) Is point G a negative integer or a positive integer?

Sol: Negative integer.

(c) Write integers for points B and E.

Sol: B is $+4$ and E is -10

(d) Which point marked on this number line has the least value?

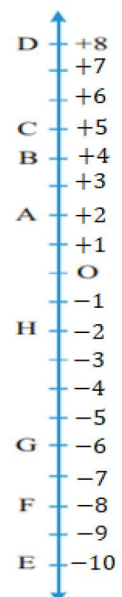
Sol: E

(e) Arrange all the points in decreasing order of value.

Sol: D, C, B, A, H, G, F, E.

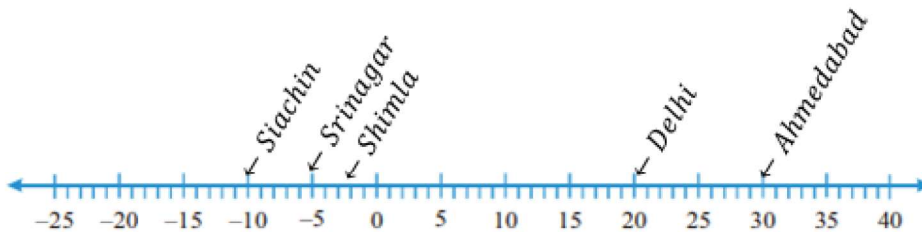
5. Following is the list of temperatures of five places in India on a particular day of the year

(a) Write the temperatures of these places in the form of integers in the blank column.



Place	Temperature	
Siachin	10°C below 0°C	-10°C
Shimla	2°C below 0°C	-2°C.
Ahmedabad	30°C above 0°C	+30°C
Delhi	20°C above 0°C	20°C
Srinagar	5°C below 0°C	-5°C

(b) Following is the number line representing the temperature in degree Celsius. Plot the name of the city against its temperature.



(c) Which is the coolest place?

Sol: Siachin is the coolest place.

(d) Write the names of the places where temperatures are above 10°C.

Sol: Delhi and Ahmedabad.

6. In each of the following pairs, which number is to the right of the other on the number line?

(a) 2, 9 (b) -3, -8 (c) 0, -1 (d) -11, 10 (e) -6, 6 (f) 1, -100

Sol: (a) 9 (b) -3 (c) 0 (d) 10 (e) 6 (f) 1

7. Write all the integers between the given pairs (write them in the increasing order.)

(a) 0 and -7

Sol: -6, -5, -4, -3, -2, -1

(b) -4 and 4

Sol: -3, -2, -1, 0, 1, 2, 3

(c) -8 and -15

Sol: -14, -13, -12, -11, -10, -9

(d) -30 and -23

Sol: -29, -28, -27, -26, -25, -24

8. (a) Write four negative integers greater than -20.

Sol: -19, -18, -17, -16, -15, -14, -13, -12, -11, -10, .. (any four)

(b) Write four integers less than -10.

Sol: -11, -12, -13, -14, -15, -16, -17, -18, -19, ... (any four)

9. For the following statements, write True (T) or False (F). If the statement is false, correct the statement.

(a) -8 is to the right of -10 on a number line.

Sol: True

(b) -100 is to the right of -50 on a number line.

Sol: False.

Correct statement:- 100 is to the left of -50 on number line.

(c) **Smallest negative integer is - 1.**

Sol: False.

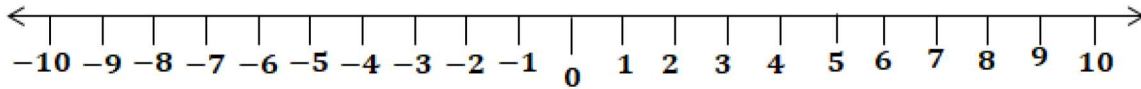
Correct statement: Greatest negative integer is - 1.

(d) **- 26 is greater than - 25.**

Sol: False.

Correct statement: - 26 is smaller than - 25.

10. Draw a number line and answer the following :



(a) **Which number will we reach if we move 4 numbers to the right of - 2.**

Sol: 2

(b) **Which number will we reach if we move 5 numbers to the left of 1.**

Sol: -4

(c) **If we are at - 8 on the number line, in which direction should we move to reach - 13?**

Sol: To the left.

(d) **If we are at - 6 on the number line, in which direction should we move to reach - 1?**

Sol: To the right.

Addition of Integers

(i) **When two positive integers are added, we get a positive integer**

[e.g. $(+ 3) + (+ 2) = + 5$]

(ii) **When two negative integers are added, we get a negative integer**

[e.g. $(-2) + (- 1) = - 3$].

(iii) **When you have one positive and one negative integer, you must subtract, but answer will take the sign of the bigger integer.**

Try These

Find the answers of the following additions:

(a) $(- 11) + (- 12) = -23$

(b) $(+ 10) + (+ 4) = +14$

(c) $(- 32) + (- 25) = -57$

(d) $(+ 23) + (+ 40) = +63$

(a) $(- 7) + (+ 8) = +1$

(b) $(- 9) + (+13) = +4$

(c) $(+ 7) + (- 10) = -3$

(d) $(+12) + (- 7) = +5$

Addition of integers on a number line

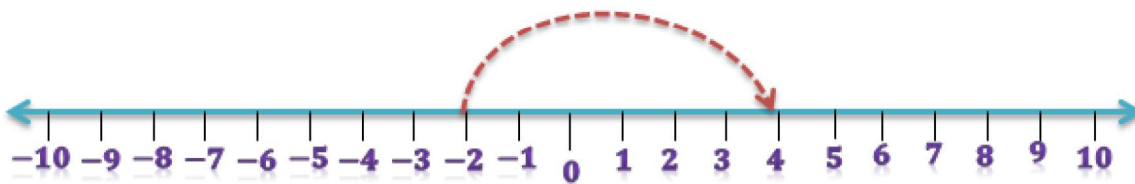
To add a positive integer we move towards the right on a number line and for adding a negative integer we move towards left.

Try These

1. Find the solution of the following additions using a number line :

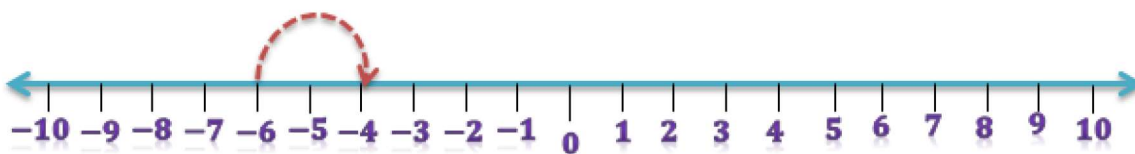
(a) $(-2) + 6 = 4$

Start at -2 and move 6 steps to right



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

Start at -6 and move 2 steps to right



2. Find the solution of the following without using number line :

(a) $(+7) + (-11) = -4$

(b) $(-13) + (+10) = -3$

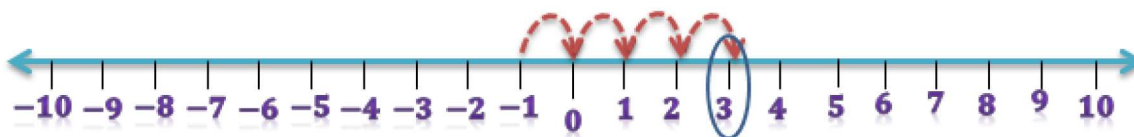
(c) $(-7) + (+9) = +2$

(d) $(+10) + (-5) = +5$

Example 3 : Using the number line, write the integer which is

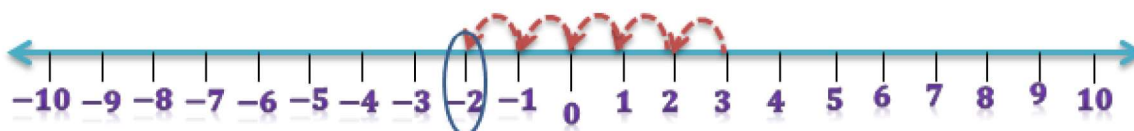
(a) 4 more than -1

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



(b) 5 less than 3

Sol: $3 + (-5) = -2$



Example 4 : Find the sum of $(-9) + (+4) + (-6) + (+3)$

Sol: $(-9) + (+4) + (-6) + (+3)$
 $= (-9) + (-6) + (+3) + (+4)$
 $= (-15) + (+7) = -8$

Example 5 : Find the value of $(30) + (-23) + (-63) + (+55)$

Solution : $(30) + (+55) + (-23) + (-63)$
 $= 85 + (-86) = -1$

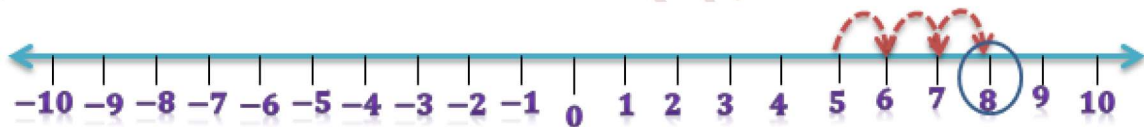
Example 6 : Find the sum of $(-10), (92), (84)$ and (-15)

Solution : $(-10) + (92) + (84) + (-15)$
 $= (-10) + (-15) + 92 + 84$
 $= (-25) + 176 = 151$

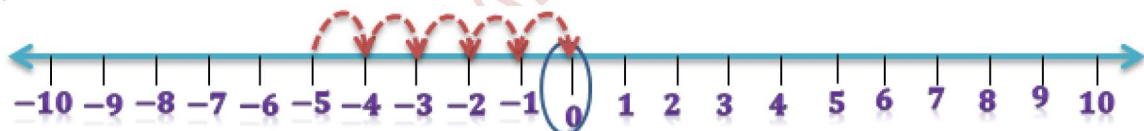
EXERCISE 6.2

1. Using the number line write the integer which is :

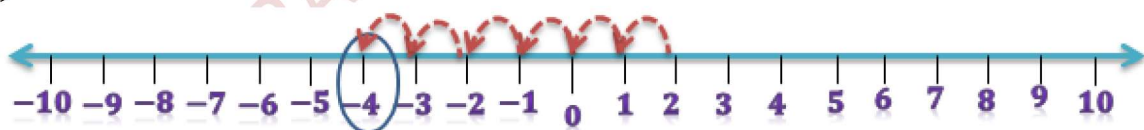
(a) 3 more than 5



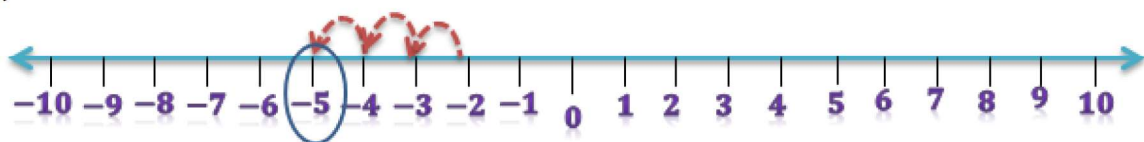
(b) 5 more than -5



(c) 6 less than 2

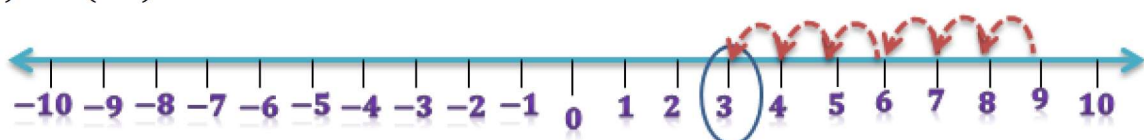


(d) 3 less than -2

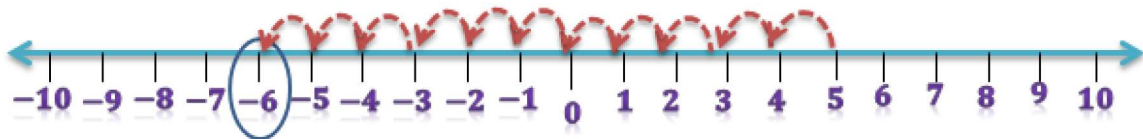


2. Use number line and add the following integers :

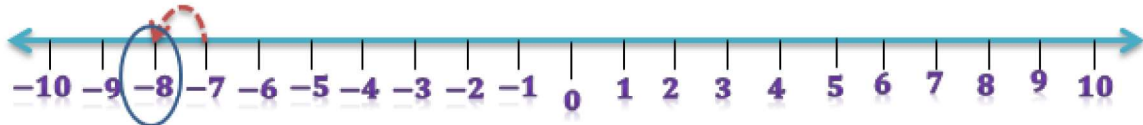
(a) $9 + (-6) = 3$



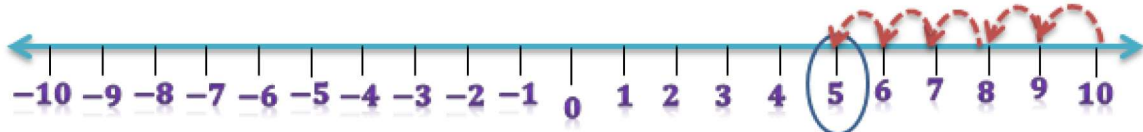
(b) $5 + (-11) = -6$



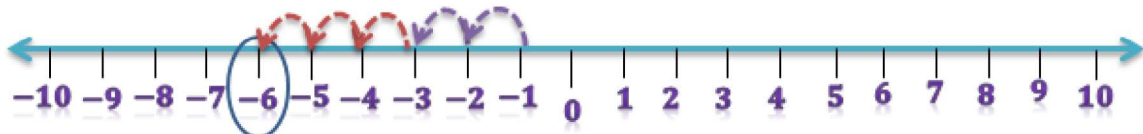
$$(c) (-1) + (-7) = -8$$



$$(d) (-5) + 10 = 5$$



$$(e) (-1) + (-2) + (-3) = -6$$



$$(f) (-2) + 8 + (-4) = 2$$

3. Add without using number line :

$$(a) 11 + (-7) = 4$$

$$(b) (-13) + (+18) = +5$$

$$(c) (-10) + (+19) = +9$$

$$(d) (-250) + (+150) = -100$$

$$(e) (-380) + (-270) = -650$$

$$(f) (-217) + (-100) = -317$$

4. Find the sum of:

$$(a) 137 \text{ and } -354$$

$$\text{Sol: } 137 + (-354) = -217$$

$$(b) -52 \text{ and } 52$$

$$\text{Sol: } (-52) + 52 = 0$$

$$(c) -312, 39 \text{ and } 192$$

$$\begin{aligned} \text{Sol: } & (-312) + 39 + 192 \\ & = (-312) + 231 = -81 \end{aligned}$$

$$(d) -50, -200 \text{ and } 300$$

$$\begin{aligned} \text{Sol: } & (-50) + (-200) + 300 \\ & = (-250) + 300 = 50 \end{aligned}$$

5. Find the sum :

$$(a) (-7) + (-9) + 4 + 16$$

$$\begin{aligned} \text{Sol: } & (-7) + (-9) + 4 + 16 \\ & = (-16) + 20 = 4 \end{aligned}$$

$$(b) (37) + (-2) + (-65) + (-8)$$

$$\text{Sol: } (37) + (-2) + (-65) + (-8)$$

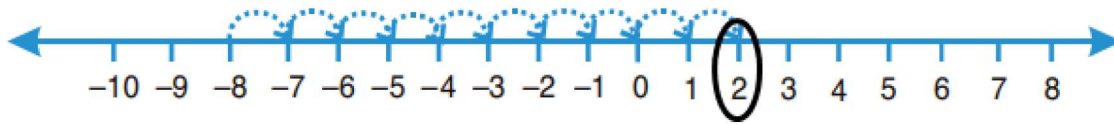
$$= 37 + (-75) = -38$$

Subtraction of Integers with the help of a Number Line

$$-(-) = +$$

Example 7 : Find the value of $-8 - (-10)$ using number line

Sol: $-8 - (-10) = -8 + 10 = 2$



Example 8 : Subtract (-4) from (-10)

sol: $(-10) - (-4) = -10 + 4 = -6$

EXERCISE 6.3

1. Find

(a) $35 - (20)$

$$= 35 - 20 = 15$$

(b) $72 - (90)$

$$= 72 - 90 = -18$$

(c) $(-15) - (-18)$

$$= -15 + 18 = 3$$

(d) $(-20) - (13)$

$$= -20 - 13 = -33$$

(e) $23 - (-12)$

$$= 23 + 12 = 35$$

(f) $(-32) - (-40)$

$$= -32 + 40 = 8$$

2. Fill in the blanks with $>$, $<$ or $=$ sign

(a) $(-3) + (-6) < (-3) - (-6)$

Sol: $(-3) + (-6) = -9$

$$(-3) - (-6) = -3 + 6 = 3$$

(b) $(-21) - (-10) > (-31) + (-11)$

sol: $(-21) - (-10) = -21 + 10 = -11$

$$(-31) + (-11) = -41$$

(c) $45 - (-11) > 57 + (-4)$

Sol: $45 - (-11) = 45 + 11 = 56$

$$57 + (-4) = 53$$

(d) $(-25) - (-42) > (-42) - (-25)$

Sol: $(-25) - (-42) = -25 + 42 = 17$

$$(-42) - (-25) = -42 + 25 = -17$$

3. Fill in the blanks.

(a) $(-8) + \underline{\quad} = 0$

Sol: $(-8) + 8 = 0$

(b) $13 + \underline{\quad} = 0$

Sol: $13 + (-13) = 0$

(c) $12 + (-12) = \underline{\quad}$

Sol: $12 + (-12) = 0$

(d) $(-4) + \underline{\quad} = -12$

Sol: $(-4) + (-8) = -12$

(e) $\underline{\quad} - 15 = -10$

Sol: $5 - 15 = -10$

4. Find

(a) $(-7) - 8 - (-25)$

Sol: $(-7) - 8 - (-25)$

$$= -7 - 8 + 25$$

$$= -15 + 25 = 10$$

(b) $(-13) + 32 - 8 - 1$

Sol: $(-13) + 32 - 8 - 1$

$$= (-13) - 8 - 1 + 32$$

$$= -22 + 32 = 10$$

(c) $(-7) + (-8) + (-90)$

Sol: $(-7) + (-8) + (-90)$

$$= (-15) + (-90)$$

$$= -105$$

(d) $50 - (-40) - (-2)$

Sol: $50 - (-40) - (-2)$

$$= 50 + 40 + 2$$

$$= 92$$

Please download VI to X class all maths
notes from website

<https://sureshmathsmaterial.com/>

