Chapter - 3
Integers

Exercise

In questions 1 to 17, only one of the four options is correct. Write the correct one.

1. Every integer less than 0 has the sign

(A) + (B) – (C) × (D) ÷

Solution:

Integer less than 0 are negative integers and hence are accompanied by – sign.

So, option (B) is correct.

2. The integer '5 units to the right of 0 on the number line' is

(A) +5 (B) –5 (C) +4 (D) – 4

Solution:

On the right side of the number line there are positive integers and are spaced by one unit. Thus, 5 units to the right of 0 on the number line is +5.

So, option (A) is correct.

3. The predecessor of the integer –1 is

(A) 0 (B) 2 (C) –2 (D) 1

Solution:

Predecessor of any number is defined as one less than the number.

Thus, predecessor of –1 = –1–1 = –2

So, option (C) is correct.

4. Number of integers lying between –1 and 1 is

(A) 1 (B) 2 (C) 3 (D) 0

Solution:

Zero is the only integer lying between –1 and 1. So, number of integers lying between –1 and 1 is 1.

So, option (D) is correct.

5. Number of whole numbers lying between –5 and 5 is

(A) 10 (B) 3 (C) 4 (D) 5

Solution:

Whole numbers lying between –5 and 5 are 0, 1, 2, 3 and 4 respectively which are five in total.

So, option (D) is correct.

6. The greatest integer lying between –10 and –15 is

(A) –10 (B) –11 (C) –15 (D) –14

Solution:

Integers between –10 and –15 are –11, –12, –13, –14 and greatest among them is –11.

So, option (B) is correct.

7. The least integer lying between –10 and –15 is

(A) –10 (B) –11 (C) –15 (D) –14

Solution:

Integers between –10 and –15 are –11, –12, –13, –14 and least among them is –14.

So, option (D) is correct.

8. On the number line, the integer 5 is located

(A) to the left of 0

(B) to the right of 0

(C) to the left of 1

(D) to the left of –2

Solution:

All the positive integers are located on the right side of 0, so 5 also located on the right side of 0 on the number line.

So, option (B) is correct.

9. In which of the following pairs of integers, the first integer is not on the left of the other integer on the number line?

(A) (–1, 10) **(B) (–3, –5)** **(C) (–5, –3)** **(D) (–6, 0)**

Solution:

In (–3, –5), –3 does not lie on the left side of –5 on the number line.

So, option (B) is correct.

10. The integer with negative sign (–) is always less than

(A) 0 **(B) –3** **(C) –1** **(D) –2**

Solution:

The integer with negative sign (–) is always less than 0 on the number line.

So, option (A) is correct.

11. An integer with positive sign (+) is always greater than

(A) 0 **(B) 1** **(C) 2** **(D) 3**

Solution:

All the positive integers lie on the right side of 0 on the number line. Hence, any integer with positive sign (+) is always greater than 0.

So, option (A) is correct.

12. The successor of the predecessor of –50 is

(A) –48 **(B) –49** **(C) –50** **(D) –51**

Solution:

Successor of any number is defined as plus one to that number and predecessor of the number on the other hand is defined as minus one from that number.

Thus here predecessor of –50 is –50 – 1 = – 51

Now successor of –51 is –51 + 1 = –50.

So, option (C) is correct.

13. The additive inverse of a negative integer

(A) is always negative

(B) is always positive

(C) is the same integer

(D) zero

Solution:

Additive Inverse of a number is the number when added to the given number gives 0 result. So, positive number added to a negative number will give 0 in answer.

So, option (B) is correct.

14. Amulya and Amar visited two places A and B respectively in Kashmir and recorded the minimum temperatures on a particular day as –4°C at A and –1°C at B. Which of the following statement is true?

(A) A is cooler than B

(B) B is cooler than A

(C) There is a difference of 2°C in the temperature

(D) The temperature at A is 4°C higher than that at B.

Solution:

Lower the temperature, cooler it is. This implies –4 ° C at A is more cooler –1 ° C at B.

So, option (A) is correct.

15. When a negative integer is subtracted from another negative integer, the sign of the result

(A) is always negative

(B) is always positive

(C) is never negative

(D) depends on the numerical value of the integers

Solution:

When a negative integer is subtracted from another negative integer the sign of the result can be positive as well as negative depending on the numerical values of the given integers.

So, option (D) is correct.

16. The statement "When an integer is added to itself, the sum is greater than the integer" is

(A) always true

(B) never true

(C) true only when the integer is positive

(D) true for non-negative integers

Solution:

When an integer is added to itself, the sum is greater than the integer only in the case when the integer is positive. In case of negative integer the sum will always be less than the integer.

So, option (C) is true.

17. Which of the following shows the maximum rise in temperature?

(A) 0°C to 10°C

(B) –4°C to 8°C

(C) –15°C to –8°C

(D) –7°C to 0°C

Solution:

The maximum difference of 12°C is observed in case of option (B) –4°C to 8°C.

So, option (B) is correct.

In questions 18 to 39, state whether the given statements are true (T) or false (F) :

18. The smallest natural number is zero.

Solution:

Smallest natural number is 1 and not 0.

So, the given statement is **False**.

19. Zero is not an integer as it is neither positive nor negative.

Solution:

Zero is a integer and yes, it is not positive or negative but rather neutral integer.

So, the given statement is **False**.

20. The sum of all the integers between –5 and –1 is –6.

Solution:

Sum of all the integers between –5 and –1 is –9 and not –6.

So, the given statement is **False**.

21. The successor of the integer 1 is 0.

Solution:

Successor of any number is defined as plus one to that number and so successor of integer 1 = 1 + 1 = 2.

So, the given statement is **False**.

22. Every positive integer is larger than every negative integer.

Solution:

Value of every positive integer is always greater than every negative integer.

So, the given statement is **True**.

23. The sum of any two negative integers is always greater than both the integers.

Solution:

Sum of any two negative integers is always lesser than both the integers.

So, the given statement is **False**.

24. The sum of any two negative integers is always smaller than both the integers.

Solution:

It is true that sum of any two negative integers is always smaller than both the integers.

So, the given statement is **True**.

25. The sum of any two positive integers is greater than both the integers.

Solution:

It is true that sum of any two positive integers is always greater than both the integers.

So, the given statement is **True**.

26. All whole numbers are integers.

Solution:

All the positive integers are whole numbers and hence we can say that all whole numbers are integers.

So, the given statement is **True**.

27. All integers are whole numbers.

Solution:

Negative integers are not whole numbers and hence, all integers are not whole numbers.

So, the given statement is **False**.

28. Since 5 > 3, therefore –5 > –3

Solution:

It is true that 5 > 3 but as we move towards left side of the number line value of integers starts to decrease. Since –5 lies on the left side of –3 and so –5 < –3.

So, the given statement is **False**.

29. Zero is less than every positive integer.

Solution:

Zero is the neutral integer and to the right of it, series of positive integers starts. This implies Zero is less than every positive integer.

So, the given statement is **True**.

30. Zero is larger than every negative integer.

Solution:

Zero is the neutral integer and to the left of it, series of negative integers starts.

So, the given statement is **True**.

31. Zero is neither positive nor negative.

Solution:

It is true that Zero is neither negative nor positive but in fact it is as neutral integer.

So, the given statement is **True**.

32. On the number line, an integer on the right of a given integer is always larger than the integer.

Solution:

It is true that an integer on the right of a given integer is always larger than the integer.

So, the given statement is **True**.

33. –2 is to the left of –5 on the number line.

Solution:

On the number line –2 is to the right of –5.

So, the given statement is **False**.

34. The smallest integer is 0.

Solution:

Integers can either be negative or positive. Since all the negative integers are smaller than zero thus, 0 is not the smallest integer.

So, the given statement is **False**.

35. 6 and –6 are at the same distance from 0 on the number line.

Solution:

Both 6 and –6 are 6 units away from 0 on the number line. This implies, 6 and –6 are at the same distance from 0 on the number line.

So, the given statement is **True**.

36. The difference between an integer and its additive inverse is always even.

Solution:

Inverse is the number, when added to an integer gives 0 in the result. It is true if we take the difference of an integer with its additive inverse, we will always get an even number. Hence, sum of an integer and its additive inverse is always even.

So, the given statement is **True**.

37. The sum of an integer and its additive inverse is always zero.

Solution:

Inverse is the number, when added to an integer gives 0 in the result. Hence, sum of an integer and its additive inverse is always Zero.

So, the given statement is **True**.

38. The sum of two negative integers is a positive integer.

Solution:

The sum of two negative integers results in a negative integer only.

So, the given statement is **False**.

39. The sum of three different integers can never be zero.

Solution:

Sum of three different integers can be zero, for e.g. if we take three different integers as 9, –3 and –6 and add them, $9 – 3 – 6 = 0$.

So, the given statement is **False**.

In questions 40 to 49, fill in the blanks to make the statements true:

40. On the number line, –15 is to the _____ of zero.

Solution:

–15 always lie on the left of zero on the number line.

On the number line, –15 is to the left of zero.

41. On the number line, 10 is to the _____ of zero.

Solution:

10 always lie on the right of zero on the number line.

On the number line, 10 is to the right of zero.

42. The additive inverse of 14 is _____.

Solution:

Additive inverse of a number is the number when added results in zero value. If we add –14 to 14 than it will give zero, hence –14 is the additive inverse of 14.

The additive inverse of 14 is –14.

43. The additive inverse of –1 is _____.

Solution:

Additive inverse of a number is the number when added results in zero value. If we add 1 to –1 than it will give zero, hence 1 is the additive inverse of –1.

The additive inverse of – 1 is 1.

44. The additive inverse of 0 is _____.

Solution:

Additive inverse of a number is the number when added results in zero value. Hence if we add 0 to 0 then the result will be 0 and so additive inverse of 0 is 0 only.

The additive inverse of 0 is 0.

45. The number of integers lying between –5 and 5 is _____.

Solution:

Integers between –5 and 5 are –4, –3, –2, –1, 0, 1, 2, 3 and 4 which are 9 in total.

The number of integers lying between –5 and 5 is **9**.

46. (–11) + (–2) + (–1) = _____.

Solution:

As given, (–11) + (–2) + (–1)

= –11 – 2 – 1

= – 11 – 3

= – 14.

(–11) + (–2) + (–1) = **– 14**.

47. _____ + (–11) + 111 = 130

Solution:

As given, let the blank be x, so we have x + (–11) + 111 = 130

x = 130 – 111 + 11

x = 30.

30 + (–11) + 111 = 130.

48. (–80) + 0 + (–90) = _____

Solution:

As given, (–80) + 0 + (–90)

= – 80 – 90

= –170.

(–80) + 0 + (–90) = **–170.**

49. _____ –3456 = –8910

Solution:

As given, let the blank be x, so we have x – 3456 = –8910

x = –8910 + 3456

x = –5454.

–5454 –3456 = –8910.

In questions 50 to 58, fill in the blanks using:

50. (–11) + (–15) _____ 11 + 15

Solution:

(–11) + (–15)

= –11 – 15

= –26

And, 11 + 15 = 26

So, (–11) + (–15) $\leq$ (11 + 15)

51. (–71) + (+9) _____ (–81) + (–9)

Solution:

(–71) + (+9)

= –71 + 9

= – 62

(–81) + (–9)

= –81 –9

= –90

So, (–71) + (+9) $\geq$ (–81) + (–9)

52. 0 _____ 1

Solution:

1 is placed at the right of zero in number line.

So, 0 $\leq$ 1

53. –60 _____ 50

Solution:

–60 is at the left of the number line from 50.

So, –60 $\leq$ 50

54. –10 _____ –11

Solution:

–10 is at the right of –11 on the number line.

So, –10 $\geq$ –11

55. –101 _____ –102

Solution:

–101 is at the right of –102 on the number line.

So, –101 $\geq$ –102

56. (–2) + (–5) + (–6) _____ (–3) + (–4) + (–6)

Solution:

(–2) + (–5) + (–6)

= –2 –5 –6

= –13

(–3) + (–4) + (–6)

= –3 –4 –6

= –13

So, (–2) + (–5) + (–6) $=$ (–3) + (–4) + (–6)

57. 0 _____ –2

Solution:

0 is at the right of –2 on the number line.

So, $0 \geq -2$

58. 1 + 2 + 3 _____ (–1) + (–2) + (–3)

Solution:

1 + 2 + 3 = 6

(–1) + (–2) + (–3)

= –1 –2 –3

= –6

So, $1 + 2 + 3 \geq (-1) + (-2) + (-3)$

59. Match the items of Column I with that of Column II:

Column I	**Column II**
(i) The additive inverse of +2	**(A) 0**
(ii) The greatest negative integer	**(B)–2**
(iii) The greatest negative even integer	**(C)2**
(iv) The smallest integer greater than every negative integer	**(D)1**
(v) Sum of predecessor and successor of –1	**(E)–1**

Solution:

(i) The additive inverse of +2 is –2.

So (i) match (B)

(ii) The greatest negative integer is –1.

So (ii) match (E)

(iii) The greatest negative even integer is –2.

So (iii) match (B)

(iv) The smallest integer greater than every negative integer is 0.

So (iv) match (A)

(v) Sum of predecessor and successor of –1 is –2.

So (v) match (B)

Hence we have,

(i) ---(B)

(ii)---(E)

(iii)---(B)

(iv)---(A)

(v)---(B)

60. Compute each of the following:

(a) 30 + (–25) + (–10)

(b) (–20) + (–5)

(c) 70 + (–20) + (–30)

(d) –50 + (–60) + 50

(e) 1 + (–2) + (– 3) + (– 4)

(f) 0 + (– 5) + (– 2)

(g) 0 – (–6) – (+6) (h) 0 – 2 – (–2)

Solution:

(a) 30 + (–25) + (–10)

= 30 – 25 – 10

= –5

(b) (–20) + (–5)

= –20 – 5

= –25

(c) 70 + (–20) + (–30)

= 70 – 20 – 30

= 20

(d) –50 + (–60) + 50

= –50 – 60 +50

= –60

(e) 1 + (–2) + (– 3) + (– 4)

= 1 – 2 – 3

= –4

(f) 0 + (– 5) + (– 2)

= 0 – 5 – 2

= –7

(g) 0 – (–6) – (+6)

= 0 + 6 – 6

= 0

(h) 0 – 2 – (–2)

= –2 + 2

= 0

61. If we denote the height of a place above sea level by a positive integer and depth below the sea level by a negative integer, write the following using integers with the appropriate signs:

(a) 200 m above sea level

(b) 100 m below sea level

(c) 10 m above sea level

(d) sea level

Solution:

(a) 200 m above sea level = +20

(b) 100 m below sea level = –100

(c) 10 m above sea level = +10

(d) sea level = 0

62. Write the opposite of each of the following:

(a) Decrease in size

(b) Failure

(c) Profit of Rs.10

(d) 1000 A.D.

(e) Rise in water level

(f) 60 km south

(g) 10 m above the danger mark of river Ganga

(h) 20 m below the danger mark of the river Brahmaputra

(i) Winning by a margin of 2000 votes

(j) Depositing Rs.100 in the Bank account

(k) 20°C rise in temperature.

Solution:

(a) Decrease in size = Increase in size

(b) Failure = Success

(c) Profit of Rs.10 = Loss of Rs.10

(d) 1000 A.D. = 1000 B.C.

(e) Rise in water level = Fall in sea level

(f) 60 km south = 60 km north

(g) 10 m above the danger mark of river Ganga = 10 m below the danger mark of river Ganga.

(h) 20 m below the danger mark of the river Brahmaputra = 20 m above the danger mark of the river Brahmaputra.

(i) Winning by a margin of 2000 votes = Losing by a margin of 2000 votes

(j) Depositing Rs.100 in the Bank account = Withdrawing Rs.100 from the Bank account.

(k) 20°C rise in temperature = 20°C fall in temperature

63. Temperature of a place at 12:00 noon was +5°C. Temperature increased by 3°C in first hour and decreased by 1°C in the second hour. What was the temperature at 2:00 pm?

Solution:

Initial Temperature at 12:00 noon = +5°C

Temperature in first hour increased by = 3°C and

Temperature in second hour decreased by = 1°C

Temperature at 2:00 pm: +5°C + 3°C – 1°C = 7°C

64. Write the digits 0, 1, 2, 3, ..., 9 in this order and insert '+' or '–' between them to get the result 3.

Solution:

The given digits are 0, 1, 2, 3, 4, 5, 6, 7, 8 and 9. Now inserting '+' or '–' between them to get the result 3 as:

0 – 1 – 2 – 3 – 4 – 5 – 6 + 7 + 8 + 9

65. Write the integer which is its own additive inverse.

Solution:

Integer which is its own additive inverse is 0. If we add 0 to 0 we get zero in return.

66. Write six distinct integers whose sum is 7.

Solution:

Six distinct integers whose sum is 7 are 1, –1, 2, –2, 3, 4 respectively. If we add these integers as 1 – 1 + 2 – 2 + 3 + 4 = 7, the resultant sum is 7.

67. Write the integer which is 4 more than its additive inverse.

Solution:

Integer which is 4 more than its additive inverse is 2. Additive inverse of 2 is –2 and 2 is 4 more than its –2.

68. Write the integer which is 2 less than its additive inverse.

Solution:

An integer which is 2 less than its additive inverse is –1. Additive inverse of –1 is 1 and –1 is 2 less than 1.

69. Write two integers whose sum is less than both the integers.

Solution:

Two integers whose sum is less than both the integers are –1 and –3 respectively. Their sum –1 –3 = –4 is less than the individual integers.

70. Write two distinct integers whose sum is equal to one of the integers.

Solution:

Two distinct integers whose sum is equal to one of the integers are 1 and 0 respectively. Sum of 1 and 0 is 1 + 0 = 1 which is equal to one of the integers.

71. Using number line, how do you compare

(a) two negative integers?

(b) two positive integers?

(c) one positive and one negative integer?

Solution:

(a) On number line, negative integers are represented by – sign and are on the left side of 0. Also the negative integer on the right side is greater than that on the left side.

(b) On number line, positive integers are represented by + sign and are on the right side of 0. Also the positive integer on the right side is greater than that on the left side.

(c) On number line, positive integers are represented by + sign and are on the right side of 0 and negative integers are represented by – sign and are on the left side of 0. Also positive integers are greater than negative integers.

72. Observe the following:

1 + 2 – 3 + 4 + 5 – 6 – 7 + 8 – 9 = –5

Change one '–' sign as '+' sign to get the sum 9.

Solution:

If – sign of 7 in given equation, 1 + 2 – 3 + 4 + 5 – 6 – 7 + 8 – 9 = –5 is changed to + sign, the resultant sum will be 9. It is shown below:

1 + 2 – 3 + 4 + 5 – 6 + 7 + 8 – 9 = 9

73. Arrange the following integers in the ascending order:

–2, 1, 0, –3, +4, –5

Solution:

Integers arranged in ascending order are as follows:

–5, –3, –2, 0, 1 and +4

74. Arrange the following integers in the descending order:

–3, 0, –1, –4, –3, –6

Solution:

Integers arranged in descending order are as follows:

0, –1, –3, –3, –4 and –6

75. Write two integers whose sum is 6 and difference is also 6.

Solution:

Two integers whose sum is 6 and difference is also 6 are 6 and 0 respectively.

76. Write five integers which are less than –100 but greater than –150.

Solution:

Five integers which are less than –100 but greater than –150 are –110, –111, –120, –130, and –131 respectively.

77. Write four pairs of integers which are at the same distance from 2 on the number line.

Solution:

Four pairs of integers which are at the same distance from 2 on the number line are (1,3), (–1, 5), (–2,6), (–3,7) respectively.

78. The sum of two integers is 30. If one of the integers is –42, then find the other.

Solution:

Given: Sum of two integers = 30 and one integer out of two integers is –42.

To find: the other integer

Now, let other integer be x and from given condition we have

$x + (–42) = 30$

$x – 42 = 30$

x = 30 + 42

x = 72

So, other integer is 72 respectively.

79. Sum of two integers is –80. If one of the integers is –90, then find the other.

Solution:

Given: Sum of two integers = –80 and one integer out of two integers is –90.

To find: the other integer

Now, let other integer be x and from given condition we have

x + (–90) = –80

x – 90 = –80

x = –80 + 90

x = 10

So, other integer is 10 respectively.

80. If we are at 8 on the number line, in which direction should we move to reach the integer

(a) –5 (b) 11 (c) 0?

Solution:

(a) If we are at 8 on the number line then we should move towards left direction on the number line to reach the integer 5.

(b) If we are at 8 on the number line then we should move towards right direction on the number line to reach the integer 11.

(c) If we are at 8 on the number line then we should move towards left direction on the number line to reach the integer 0.

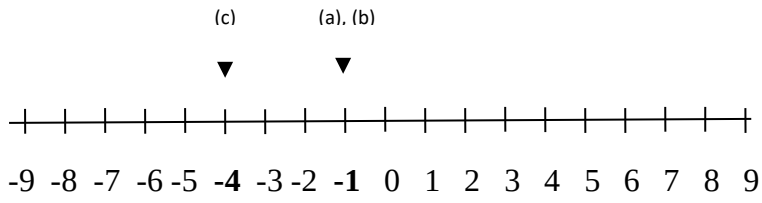
81. Using the number line, write the integer which is

(a) 4 more than –5 (b) 3 less than 2 (c) 2 less than –2

Solution:

Number line is given as follows highlighting the following integers:

(a) 4 more than –5 is –1 (b) 3 less than 2 is –1 (c) 2 less than –2 is –4



82. Find the value of

49 – (–40) – (–3) + 69

Solution:

As given in question we have – (–40) – (–3) + 69

= 40 + 3 + 69 = 112.

So, the final answer is 112 respectively.

83. Subtract –5308 from the sum [(–2100) + (–2001)]

Solution:

As per given in the question, [(–2100) + (–2001)] = – 4101.

Now, subtracting –5308 from – 4101 we have,

– 4101 – (–5308) = – 4101 + 5308

= 1207.

So, the final answer is 1207 respectively.