

EXERCISE 5.1

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1. Write the opposite of each of the following:

- (i) Increase in population
- (ii) Depositing money in a bank
- (iii) Earning money
- (iv) Going North
- (v) Gaining a weight of 4kg
- (vi) A loss of Rs 1000
- (vii) 25
- (viii) – 15

Solution:

- (i) The opposite of Increase in population is Decrease in population.
- (ii) The opposite of Depositing money in a bank is Withdrawing money from a bank.
- (iii) The opposite of earning money is Spending money.
- (iv) The opposite of Going North is Going South.
- (v) The opposite of gaining a weight of 4kg is losing a weight of 4kg.
- (vi) The opposite of a loss of Rs 1000 is a gain of Rs 1000.
- (vii) The opposite of 25 is – 25.
- (viii) The opposite of – 15 is 15.

2. Indicate the following by using integers:

- (i) 25° above zero
- (ii) 5° below zero
- (iii) A profit of Rs 800
- (iv) A deposit of Rs 2500
- (v) 3km above sea level
- (vi) 2km below level

Solution:

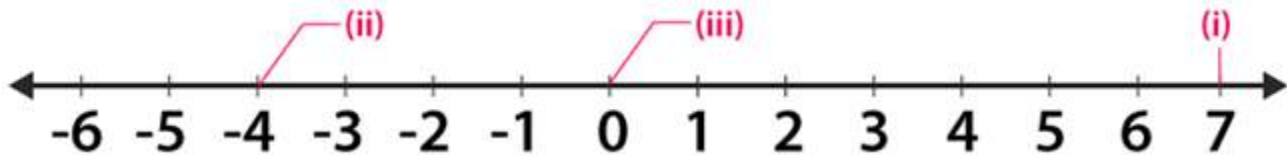
- (i) 25° above zero is + 25°.
- (ii) 5° below zero is - 5°.
- (iii) A profit of Rs 800 is + 800.
- (iv) A deposit of Rs 2500 is + 2500.
- (v) 3km above sea level is + 3.
- (vi) 2km below level is – 2.

3. Mark the following integers on a number line:

- (i) 7
- (ii) -4
- (iii) 0

Solution:

The following integers are marked on a number line as given below:



4. Which number in each of the following pairs is smaller?

- (i) 0, -4
- (ii) -3, 12
- (iii) 8, 13
- (iv) -15, -27

Solution:

(i) 0 is greater than the negative integers
So we get $-4 < 0$
Therefore, -4 is smaller.

(ii) 12 is greater than -3 on a number line
So we get
 $-3 < 12$
Therefore, -3 is smaller.

(iii) 13 is greater than 8 on a number line
So we get $8 < 13$
Therefore, 8 is smaller.

(iv) -15 is greater than -27 on a number line
So we get $-27 < -15$
Therefore, -27 is smaller.

5. Which number in each of the following pairs is larger?

- (i) 3, -4
- (ii) -12, -8
- (iii) 0, 7
- (iv) 12, -18

Solution:

(i) We know that 3 is larger than -4 on a number line
So we get $3 > -4$
Therefore, 3 is larger.

(ii) We know that -8 is larger than -12 on a number line
So we get $-8 > -12$

Therefore, - 8 is larger.

(iii) We know that 7 is larger than 0 on a number line

So we get $7 > 0$

Therefore, 7 is larger.

(iv) We know that 12 is larger than $- 18$ on a number line

So we get $12 > - 18$

Therefore, 12 is larger.

6. Write all integers between:

(i) $- 7$ and 3

(ii) $- 2$ and 2

(iii) $- 4$ and 0

(iv) 0 and 3

Solution:

(i) The integers between $- 7$ and 3 are

$- 6, - 5, - 4, - 3, - 2, - 1, 0, 1, 2$

(ii) The integers between $- 2$ and 2 are

$- 1, 0, 1.$

(iii) The integers between $- 4$ and 0 are

$- 3, - 2, - 1$

(iv) The integers between 0 and 3 are

$1, 2.$

7. How many integers are between?

(i) $- 4$ and 3

(ii) 5 and 12

(iii) $- 9$ and $- 2$

(iv) 0 and 5

Solution:

(i) The integers between $- 4$ and 3 are

$- 3, - 2, - 1, 0, 1, 2$

Therefore, number of integers between $- 4$ and 3 are $6.$

(ii) The integers between 5 and 12 are

$6, 7, 8, 9, 10, 11$

Therefore, number of integers between 5 and 12 are $6.$

(iii) The integers between $- 9$ and $- 2$ are

$- 8, - 7, - 6, - 5, - 4, - 3$

Therefore, number of integers between $- 9$ and $- 2$ are $6.$

(iv) The integers between 0 and 5 are

$1, 2, 3, 4$

Therefore, number of integers between 0 and 5 are 4.

8. Replace * in each of the following by < or > so that the statement is true:

(i) $2 * 5$

(ii) $0 * 3$

(iii) $0 * -7$

(iv) $-18 * 15$

(v) $-235 * -532$

(vi) $-20 * 20$

Solution:

(i) $2 < 5$

(ii) $0 < 3$

(iii) $0 > -7$

(iv) $-18 < 15$

(v) $-235 > -532$

(vi) $-20 < 20$

9. Write the following integers in increasing order:

(i) $-8, 5, 0, -12, 1, -9, 15$

(ii) $-106, 107, -320, -7, 185$

Solution:

(i) $-8, 5, 0, -12, 1, -9, 15$ can be written in increasing order as
 $-12, -9, -8, 0, 1, 5, 15$

(ii) $-106, 107, -320, -7, 185$ can be written in increasing order as
 $-320, -106, -7, 107, 185$.

10. Write the following integers in decreasing order:

(i) $-15, 0, -2, -9, 7, 6, -5, 8$

(ii) $-154, 123, -205, -89, -74$

Solution:

(i) $-15, 0, -2, -9, 7, 6, -5, 8$ can be written in decreasing order as
 $8, 7, 6, 0, -2, -5, -9, -15$

(ii) $-154, 123, -205, -89, -74$ can be written in decreasing order as
 $123, -74, -89, -154, -205$

11. Using the number line, write the integer which is:

(i) 2 more than 3

(ii) 5 less than 3

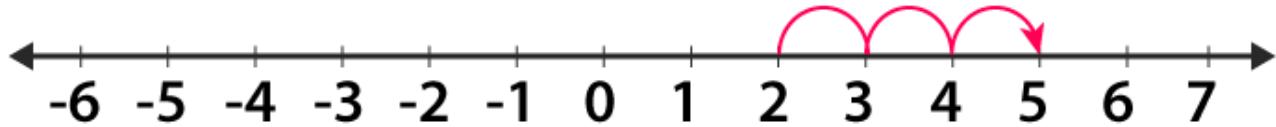
(iii) 4 more than -9

Solution:

(i) 2 more than 3

In order to get the integer 2 more than 3

We draw a number line from 2 and proceed 3 units to the right to obtain 5

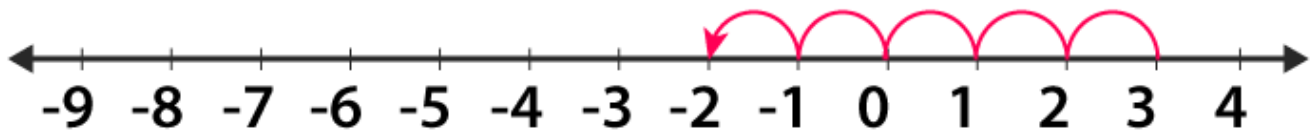


Therefore, 2 more than 3 is 5.

(ii) 5 less than 3

In order to get the integer 5 less than 3

We draw a number line from 3 and proceed 5 units to the left to obtain -2

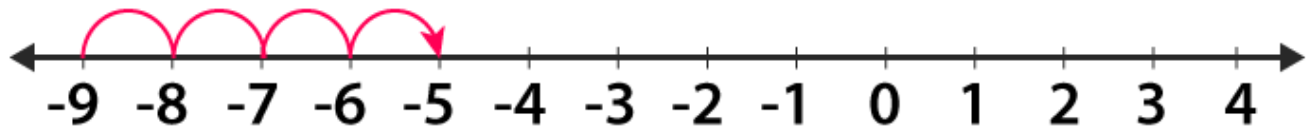


Therefore, 5 less than 3 is -2 .

(iii) 4 more than -9

In order to get the integer 4 more than -9

We draw a number line from -9 and proceed 4 units to the right to obtain -5



Therefore, 4 more than -9 is -5 .

12. Write the absolute value of each of the following:

(i) 14

(ii) -25

(iii) 0

(iv) -125

(v) -248

(vi) $a - 7$, if a is greater than 7

(vii) $a - 7$, if $a - 2$ is less than 7

(viii) $a + 4$, if a is greater than -4

(ix) $a + 4$ if a is less than -4

(x) $|-3|$

(xi) $-|-5|$

(xii) $|12 - 5|$

Solution:

(i) The absolute value of 14 is

$$|14| = 14$$

(ii) The absolute value of -25 is
 $|-25| = 25$

(iii) The absolute value of 0 is
 $|0| = 0$

(iv) The absolute value of -125 is
 $|-125| = 125$

(v) The absolute value of -248 is
 $|-248| = 248$

(vi) The absolute value of $a - 7$, if a is greater than 7 is
 $|a - 7| = a - 7$ where $a > 7$

(vii) The absolute value of $a - 7$, if $a - 2$ is less than 7 is
 $|a - 7| = -(a - 7)$ where $a - 2 < 7$

(viii) The absolute value of $a + 4$, if a is greater than -4 is
 $|a + 4| = a + 4$ where $a > -4$

(ix) The absolute value of $a + 4$ if a is less than -4 is
 $|a + 4| = -(a + 4)$ where $a < -4$

(x) The absolute value of $|-3|$ is
 $|-3| = 3$

(xi) The absolute value of $-|-5|$ is
 $-|-5| = 5$

(xii) The absolute value of $|12 - 5|$ is
 $|12 - 5| = 7$

13. (i) Write 4 negative integers less than -10 .

(ii) Write 6 negative integers just greater than -12 .

Solution:

(i) The 4 negative integers less than -10 are
 $-11, -12, -13, -14$

(ii) The 6 negative integers just greater than -12 are
 $-11, -10, -9, -8, -7, -6$

14. Which of the following statements are true?

(i) The smallest integer is zero.

(ii) The opposite of zero is zero.

(iii) Zero is not an integer.

(iv) 0 is larger than every negative integer.

(v) The absolute value of an integer is greater than the integer.

- (vi) A positive integer is greater than its opposite.
(vii) Every negative integer is less than every natural number.
(viii) 0 is the smallest positive integer.

Solution:

- (i) False. The smallest integer is 1.
(ii) True. 0 is neither positive nor negative so the opposite is 0.
(iii) False. Zero is an integer which is neither positive nor negative.
(iv) True. 0 is larger than -1 .
(v) False. The absolute value of an integer is the numerical value.
(vi) True. 3 is greater than -3 .
(vii) True. -3 is less than 1.
(viii) False. 1 is the smallest positive integer.

EXERCISE 5.2

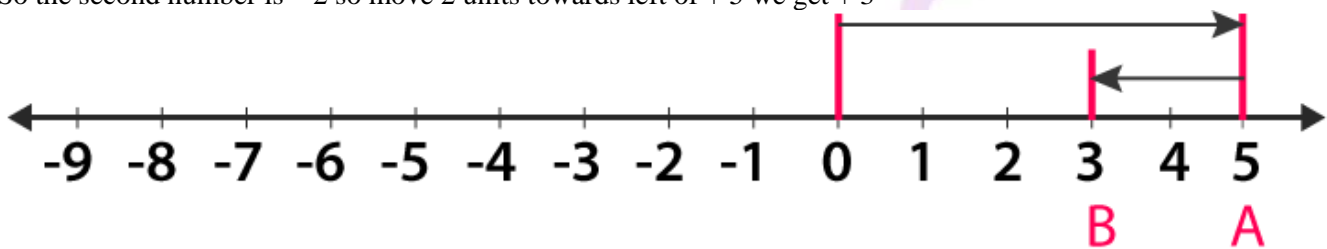
1. Draw a number line and represent each of the following on it:

- (i) $5 + (-2)$
- (ii) $(-9) + 4$
- (iii) $(-3) + (-5)$
- (iv) $6 + (-6)$
- (v) $(-1) + (-2) + 2$
- (vi) $(-2) + 7 + (-9)$

Solution:

(i) $5 + (-2)$

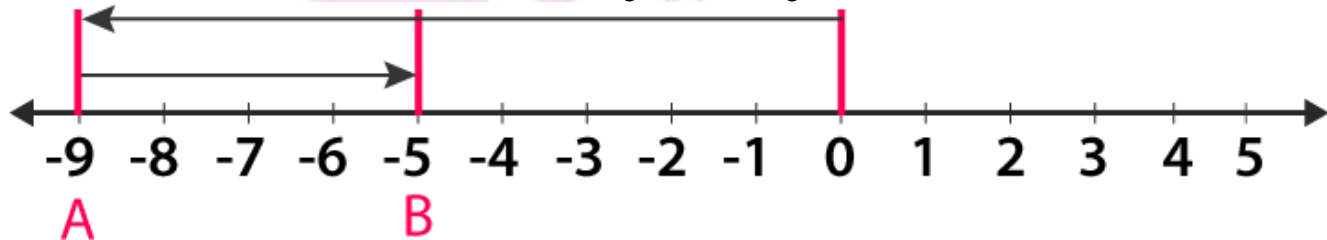
From 0 move towards right of first five units to obtain + 5
So the second number is -2 so move 2 units towards left of + 5 we get + 3



Therefore, $5 + (-2) = 3$.

(ii) $(-9) + 4$

From 0 move towards left of nine units to obtain -9
So the second number is 4 so move 4 units towards right of -9 we get -5



Therefore, $(-9) + 4 = -5$.

(iii) $(-3) + (-5)$

From 0 move towards left of three units to obtain -3
So the second number is -5 so move 5 units towards left of -3 we get -8

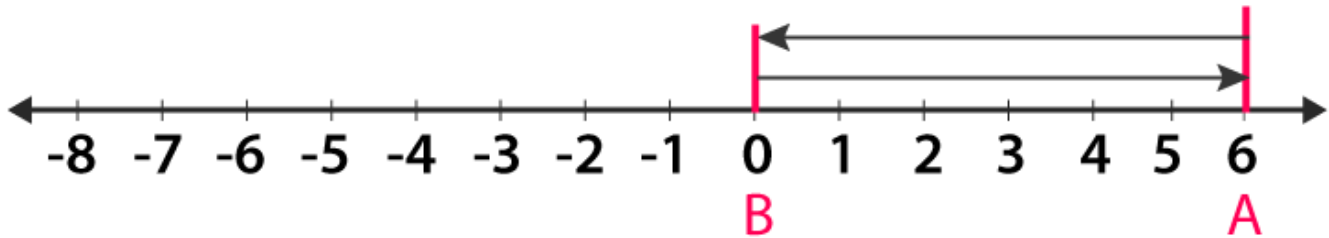


Therefore, $(-3) + (-5) = -8$.

(iv) $6 + (-6)$

From zero move towards right of six units to obtain 6

So the second number is -6 so move 6 units towards left of 6 we get 0



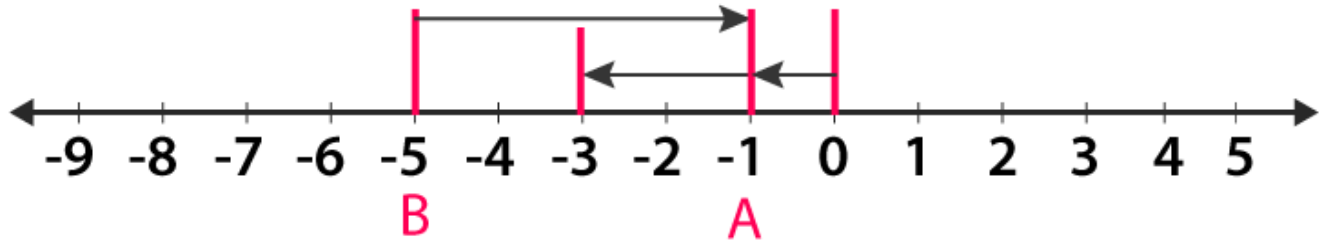
Therefore, $6 + (-6) = 0$.

(v) $(-1) + (-2) + 2$

From zero move towards left of one unit to obtain -1

So the second number is -2 so move 2 units towards left of -1 we get -3

The third number is 2 so move 2 units towards right of -3 we get -1



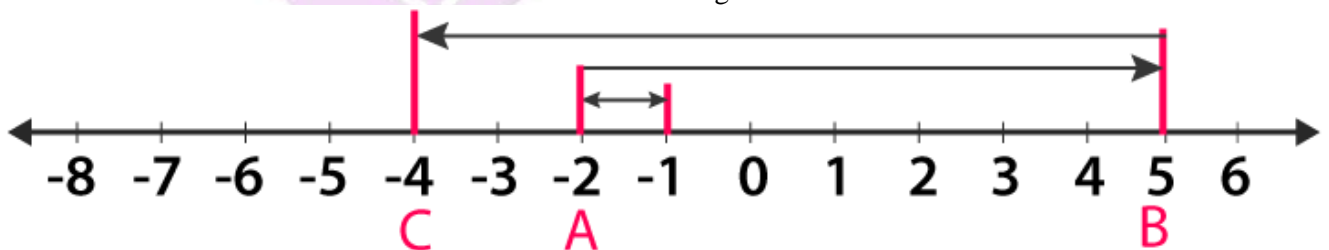
Therefore, $(-1) + (-2) + 2 = -1$.

(vi) $(-2) + 7 + (-9)$

From zero move towards left of two units to obtain -2

So the second number is 7 so move 7 units towards right of -2 we get 5

The third number is -9 so move 9 units towards left of 5 we get -4



Therefore, $(-2) + 7 + (-9) = -4$.

2. Find the sum of

(i) -557 and 488

(ii) -522 and -160

(iii) 2567 and -325

(iv) -10025 and 139

(v) 2547 and -2548

(vi) 2884 and -2884

Solution:

(i) -557 and 488

We get

$$-557 + 488$$

It can be written as

$$|-557| - |488| = 557 - 488 = 69.$$

(ii) -522 and -160

We get

$$-522 + (-160)$$

It can be written as

$$-522 - 160 = -682$$

(iii) 2567 and -325

We get

$$2567 + (-325)$$

It can be written as

$$2567 - 325 = 2242$$

(iv) -10025 and 139

We get

$$-10025 + 139$$

It can be written as

$$-10025 + 139 = -9886$$

(v) 2547 and -2548

We get

$$2547 + (-2548)$$

It can be written as

$$2547 - 2548 = -1$$

(vi) 2884 and -2884

We get

$$2884 + (-2884)$$

It can be written as

$$2884 - 2884 = 0$$

EXERCISE 5.3

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1. Find the additive inverse of each of the following integers:

- (i) 52
- (ii) – 176
- (iii) 0
- (iv) 1

Solution:

- (i) The additive inverse of 52 is – 52.
- (ii) The additive inverse of – 176 is 176.
- (iii) The additive inverse of 0 is 0.
- (iv) The additive inverse of 1 is – 1.

2. Find the successor of each of the following integers:

- (i) – 42
- (ii) -1
- (iii) 0
- (iv) – 200
- (v) -99

Solution:

- (i) The successor of – 42 is
 $-42 + 1 = -41$
- (ii) The successor of – 1 is
 $-1 + 1 = 0$
- (iii) The successor of 0 is
 $0 + 1 = 1$
- (iv) The successor of – 200 is
 $-200 + 1 = -199$
- (v) The successor of – 99 is
 $-99 + 1 = -98$

3. Find the predecessor of each of the following integers:

- (i) 0
- (ii) 1
- (iii) – 1
- (iv) – 125
- (v) 1000

Solution:

- (i) The predecessor of 0 is
 $0 - 1 = -1$

(ii) The predecessor of 1 is

$$1 - 1 = 0$$

(iii) The predecessor of -1 is

$$-1 - 1 = -2$$

(iv) The predecessor of -125 is

$$-125 - 1 = -126$$

(v) The predecessor of 1000 is

$$1000 - 1 = 999$$

4. Which of the following statements are true?

(i) The sum of a number and its opposite is zero.

(ii) The sum of two negative integers is a positive integer.

(iii) The sum of a negative integer and a positive integer is always a negative integer.

(iv) The successor of -1 is 1.

(v) The sum of three different integers can never be zero.

Solution:

(i) True. $1 - 1 = 0$

(ii) False. $-1 - 1 = -2$

(iii) False. $-2 + 3 = 1$

(iv) False. The successor of -1 is 0.

(v) False. $1 + 2 - 3 = 0$

5. Write all integers whose absolute values are less than 5.

Solution:

The integers whose absolute values are less than 5 are

-4, -3, -2, -1, 0, 1, 2, 3, 4

6. Which of the following is false:

(i) $|4 + 2| = |4| + |2|$

(ii) $|2 - 4| = |2| + |4|$

(iii) $|4 - 2| = |4| - |2|$

(iv) $|(-2) + (-4)| = |-2| + |-4|$

Solution:

(i) True.

(ii) False.

(iii) True.

(iv) True.

7. Complete the following table:

+	-6	-4	-2	0	2	4	6
6						10	
4							
2							8
0	-6						
-2							
-4						0	
-6				-6			

From the above table:

(i) Write all the pairs of integers whose sum is 0.

(ii) Is $(-4) + (-2) = (-2) + (-4)$?

(iii) Is $0 + (-6) = -6$?

Solution:

+	-6	-4	-2	0	2	4	6
6	0	2	4	6	8	10	12
4	-2	0	2	4	6	8	10
2	-4	-2	0	2	4	6	8
0	-6	-4	-2	0	2	4	6
-2	-8	-6	-4	-2	0	2	4
-4	-10	-8	-6	-4	-2	0	2
-6	-12	-10	-8	-6	-4	-2	0

(i) The pairs of integers whose sum is 0 are
 $(6, -6)$, $(4, -4)$, $(2, -2)$, $(0, 0)$

(ii) Yes. By using commutativity of addition $(-4) + (-2) = (-2) + (-4)$

(iii) Yes. By using additive identity $0 + (-6) = -6$.

8. Find an integer x such that

(i) $x + 1 = 0$

(ii) $x + 5 = 0$

(iii) $-3 + x = 0$

(iv) $x + (-8) = 0$

(v) $7 + x = 0$

(vi) $x + 0 = 0$

Solution:

(i) $x + 1 = 0$

Subtracting 1 on both sides

$$x + 1 - 1 = 0 - 1$$

We get

$$x = -1$$

(ii) $x + 5 = 0$

By subtracting 5 on both sides

$$x + 5 - 5 = 0 - 5$$

So we get

$$x = -5$$

(iii) $-3 + x = 0$

By adding 3 on both sides

$$-3 + x + 3 = 0 + 3$$

So we get

$$x = 3$$

(iv) $x + (-8) = 0$

By adding 8 on both sides

$$x - 8 + 8 = 0 + 8$$

So we get

$$x = 8$$

(v) $7 + x = 0$

By subtracting 7 on both sides

$$7 + x - 7 = 0 - 7$$

So we get

$$x = -7$$

(vi) $x + 0 = 0$

So we get

$$x = 0$$

EXERCISE 5.4

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1. Subtract the first integer from the second in each of the following:

- (i) 12, -5
- (ii) - 12, 8
- (iii) - 225, - 135
- (iv) 1001, 101
- (v) - 812, 3126
- (vi) 7560, - 8
- (vii) - 3978, - 4109
- (viii) 0, - 1005

Solution:

(i) 12, -5

So by subtracting the first integer from the second
 $-5 - 12 = -17$

(ii) - 12, 8

So by subtracting the first integer from the second
 $8 - (-12) = 8 + 12 = 20$

(iii) - 225, - 135

So by subtracting the first integer from the second
 $-135 - (-225) = 225 - 135 = 90$

(iv) 1001, 101

So by subtracting the first integer from the second
 $101 - 1001 = -900$

(v) - 812, 3126

So by subtracting the first integer from the second
 $3126 - (-812) = 3126 + 812 = 3938$

(vi) 7560, - 8

So by subtracting the first integer from the second
 $-8 - 7560 = -7568$

(vii) - 3978, - 4109

So by subtracting the first integer from the second
 $-4109 - (-3978) = -4109 + 3978 = -131$

(viii) 0, - 1005

So by subtracting the first integer from the second
 $-1005 - 0 = -1005$ **2. Find the value of:**

- (i) $-27 - (-23)$
- (ii) $-17 - 18 - (-35)$
- (iii) $-12 - (-5) - (-125) + 270$
- (iv) $373 + (-245) + (-373) + 145 + 3000$

$$(v) 1 + (-475) + (-475) + (-475) + (-475) + 1900$$

$$(vi) (-1) + (-304) + 304 + 304 + (-304) + 1$$

Solution:

$$(i) -27 - (-23)$$

So we get

$$= -27 + 23$$

On further calculation

$$= 23 - 27$$

We get

$$= -4$$

$$(ii) -17 - 18 - (-35)$$

So we get

$$= -35 + 35$$

On further calculation

$$= 0$$

$$(iii) -12 - (-5) - (-125) + 270$$

So we get

$$= -12 + 5 + 125 + 270$$

On further calculation

$$= 400 - 12$$

We get

$$= 388$$

$$(iv) 373 + (-245) + (-373) + 145 + 3000$$

So we get

$$= 373 - 245 - 373 + 145 + 3000$$

On further calculation

$$= 3145 + 373 - 373 - 245$$

We get

$$= 3145 - 245$$

By subtraction

$$= 2900$$

$$(v) 1 + (-475) + (-475) + (-475) + (-475) + 1900$$

So we get

$$= 1 - 950 - 950 + 1900$$

On further calculation

$$= 1900 + 1 - 1900$$

We get

$$= 1$$

$$(vi) (-1) + (-304) + 304 + 304 + (-304) + 1$$

So we get

$$= -1 + 1 - 304 + 304 - 304 + 304$$

On further calculation

$$= 0$$

3. Subtract the sum of – 5020 and 2320 from – 709.

Solution:

We know that the sum of -5020 and 2320 is

$$-5020 + 2320$$

It can be written as

$$= 2320 - 5020$$

So we get

$$= - 2700$$

Subtracting from – 709 we get

$$= - 709 - (-2700)$$

We get

$$= - 709 + 2700$$

By subtraction

$$= 1991$$

4. Subtract the sum of – 1250 and 1138 from the sum of 1136 and - 1272.

Solution:

We know that the sum of – 1250 and 1138 is

$$-1250 + 1138$$

It can be written as

$$= 1138 - 1250$$

So we get

$$= - 112$$

We know that the sum of 1136 and – 1272 is

$$1136 - 1272 = - 136$$

So we get

$$-136 - (-112) = - 136 + 112 = -24$$

5. From the sum of 233 and – 147, subtract – 284.

Solution:

We know that the sum of 233 and – 147 is

$$233 - 147 = 86$$

Subtracting – 284 we get

$$86 - (-284) = 86 + 284 = 370$$

6. The sum of two integers is 238. If one of the integers is – 122, determine the other.

Solution:

It is given that

$$\text{Sum of two integers} = 238$$

$$\text{One of the integers} = - 122$$

$$\text{So the other integer} = - (-122) + 238$$

On further calculation

$$\text{Other integer} = 238 + 122 = 360$$

7. The sum of two integers is – 223. If one of the integers is 172, find the other.

Solution:

It is given that

$$\text{Sum of two integers} = -223$$

$$\text{One of the integers} = 172$$

$$\text{So the other integer} = -223 - 172 = -395$$

8. Evaluate the following:

$$(i) -8 - 24 + 31 - 26 - 28 + 7 + 19 - 18 - 8 + 33$$

$$(ii) -26 - 20 + 33 - (-33) + 21 + 24 - (-25) - 26 - 14 - 34$$

Solution:

$$(i) -8 - 24 + 31 - 26 - 28 + 7 + 19 - 18 - 8 + 33$$

We get

$$= -8 - 24 - 26 - 28 - 18 - 8 + 31 + 7 + 19 + 33$$

On further calculation

$$= -32 - 26 - 28 - 26 + 38 + 19 + 33$$

It can be written as

$$= 38 - 32 - 26 - 28 + 33 - 26 + 19$$

So we get

$$= 6 - 26 - 28 + 7 + 19$$

By calculation

$$= 6 - 28 - 26 + 26$$

$$= 6 - 28$$

By subtraction

$$= -22$$

$$(ii) -26 - 20 + 33 - (-33) + 21 + 24 - (-25) - 26 - 14 - 34$$

We get

$$= -46 + 33 + 33 + 21 + 24 + 25 - 26 - 14 - 34$$

On further calculation

$$= -46 + 66 + 21 + 24 + 25 + (-74)$$

It can be written as

$$= -46 + 66 + 70 - 74$$

So we get

$$= -46 - 4 + 66$$

By calculation

$$= -50 + 66$$

$$= 66 - 50$$

By subtraction

$$= 16$$

9. Calculate

$$1 - 2 + 3 - 4 + 5 - 6 + \dots + 15 - 16$$

Solution:

It can be written as

$$1 - 2 + 3 - 4 + 5 - 6 + 7 - 8 + 9 - 10 + 11 - 12 + 13 - 14 + 15 - 16$$

We get

$$= -1 - 1 - 1 - 1 - 1 - 1 - 1 - 1 - 1$$

By calculation
= - 8

10. Calculate the sum:

$$5 + (-5) + 5 + (-5) + \dots$$

(i) if the number of terms is 10.

(ii) if the number of terms is 11.

Solution:

(i) if the number of terms is 10

We get

$$5 + (-5) + 5 + (-5) + 5 + (-5) + 5 + (-5) + 5 + (-5)$$

On further calculation

$$= 5 - 5 + 5 - 5 + 5 - 5 + 5 - 5 + 5 - 5 = 0$$

(ii) if the number of terms is 11

We get

$$5 + (-5) + 5 + (-5) + 5 + (-5) + 5 + (-5) + 5 + (-5) + 5$$

On further calculation

$$= 5 - 5 + 5 - 5 + 5 - 5 + 5 - 5 + 5 - 5 + 5 = 5$$

11. Replace * by < or > in each of the following to make the statement true:

(i) $(-6) + (-9) * (-6) - (-9)$

(ii) $(-12) - (-12) * (-12) + (-12)$

(iii) $(-20) - (-20) * 20 - (65)$

(iv) $28 - (-10) * (-16) - (-76)$

Solution:

(i) $(-6) + (-9) < (-6) - (-9)$

(ii) $(-12) - (-12) > (-12) + (-12)$

(iii) $(-20) - (-20) > 20 - (65)$

(iv) $28 - (-10) < (-16) - (-76)$

12. If Δ is an operation on integers such that $a \Delta b = -a + b - (-2)$ for all integers a, b. Find the value of

(i) $4 \Delta 3$

(ii) $(-2) \Delta (-3)$

(iii) $6 \Delta (-5)$

(iv) $(-5) \Delta 6$

Solution:

(i) $4 \Delta 3$

By substituting values in $a \Delta b = -a + b - (-2)$

We get

$$4 \Delta 3 = -4 + 3 - (-2) = 1$$

(ii) $(-2) \Delta (-3)$

By substituting values in $a \Delta b = -a + b - (-2)$

We get

$$(-2) \Delta (-3) = -(-2) + (-3) - (-2) = 1$$

(iii) $6 \Delta (-5)$

By substituting values in $a \Delta b = -a + b - (-2)$

We get

$$6 \Delta (-5) = -6 + (-5) - (-2) = -9$$

(iv) $(-5) \Delta 6$

By substituting values in $a \Delta b = -a + b - (-2)$

We get

$$(-5) \Delta 6 = -(-5) + 6 - (-2) = 13$$

13. If a and b are two integers such that a is the predecessor of b. Find the value of a – b.

Solution:

It is given that a is the predecessor of b

We can write it as

$$a + 1 = b$$

So we get

$$a - b = -1$$

14. If a and b are two integers such that a is the successor of b. Find the value of a – b.

Solution:

It is given that a is the successor of b

We can write it as

$$a - 1 = b$$

So we get

$$a - b = 1$$

15. Which of the following statements are true:

(i) $-13 > -8 - (-2)$

(ii) $-4 + (-2) < 2$

(iii) The negative of a negative integer is positive.

(iv) If a and b are two integers such that $a > b$, then $a - b$ is always a positive integer.

(v) The difference of two integers is an integer.

(vi) Additive inverse of a negative integer is negative.

(vii) Additive inverse of a positive integer is negative.

(viii) Additive inverse of a negative integer is positive.

Solution:

(i) False.

(ii) True.

(iii) True.

(iv) True.

(v) True.

(vi) False.

(vii) True.

(viii) True.

16. Fill in the blanks:

(i) $-7 + \dots = 0$

(ii) $29 + \dots = 0$

(iii) $132 + (-132) = \dots$

(iv) $-14 + \dots = 22$

(v) $-1256 + \dots = -742$

(vi) $\dots - 1234 = -4539$

Solution:

(i) $-7 + 7 = 0$

(ii) $29 + (-29) = 0$

(iii) $132 + (-132) = 0$

(iv) $-14 + 36 = 22$

(v) $-1256 + 514 = -742$

(vi) $-3305 - 1234 = -4539$

OBJECTIVE TYPE QUESTIONS
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Mark the correct alternative in each of the following:

1. Which of the following statement is true?

- (a)
- $-7 > -5$
- (b)
- $-7 < -5$
- (c)
- $(-7) + (-5) > 0$
- (d)
- $(-7) - (-5) > 0$

Solution:

The option (b) is correct answer.

In option (a)

 We know that -7 is to the left of -5

 Hence, $-7 < -5$.

In option (c)

 We know that $(-7) + (-5) = -(7 + 5) = -12$.

 So -12 is to the left of 0

 Hence $(-7) + (-5) < 0$.

In option (d)

 $(-7) - (-5) = (-7) + (\text{additive inverse of } -5) = (-7) + (5) = -(7 - 5) = -2$

 We know that -2 is to the left of 0 , so $(-7) - (-5) < 0$.

2. 5 less than -2 is

- (a) 3 (b)
- -3
- (c)
- -7
- (d) 7

Solution:

The option (c) is correct answer.

 We know that, 5 less than $-2 = (-2) - (5) = -2 - 5 = -7$
3. 6 more than -7 is

- (a) 1 (b)
- -1
- (c) 13 (d)
- -13

Solution:

The option (b) is correct answer.

 We know that, 6 more than $-7 = (-7) + 6 = -(7 - 6) = -1$
4. If x is a positive integer, then

- (a)
- $x + |x| = 0$
- (b)
- $x - |x| = 0$
- (c)
- $x + |x| = -2x$
- (d)
- $x = -|x|$

Solution:

The option (b) is correct answer.

 We know that if x is positive integer, then $|x| = x$

 Hence, $x + |x| = x + x = 2x$ and $x - |x| = x - x = 0$
5. If x is a negative integer, then

- (a)
- $x + |x| = 0$
- (b)
- $x - |x| = 0$
- (c)
- $x + |x| = 2x$
- (d)
- $x - |x| = -2x$

Solution:

The option (a) is correct answer.

 We know that x is negative integer, then $|x| = -x$

It can be written as

 $x + |x| = x - x = 0$ and $x - |x| = x - (-x) = x + x = 2x$

6. If x is greater than 2, then $|2 - x| =$
(a) $2 - x$ (b) $x - 2$ (c) $2 + x$ (d) $-x - 2$

Solution:

The option (b) is correct answer.

We know that if a is negative integer, then $|a| = -a$

It is given that x is greater than 2 where $2 - x$ is negative

Hence, $|2 - x| = -(2 - x) = -2 + x = x - 2$.

7. $9 + |-4|$ is equal to
(a) 5 (b) -5 (c) 13 (d) -13

Solution:

The option (c) is correct answer.

We know that, $|-4| = 4$

Hence $9 + |-4| = 9 + 4 = 13$

8. $(-35) + (-32)$ is equal to
(a) 67 (b) -67 (c) -3 (d) 3

Solution:

The option (b) is correct answer.

It can be written as $(-35) + (-32) = -(35 + 32) = -67$

9. $(-29) + 5$ is equal to
(a) 24 (b) 34 (c) -34 (d) -24

Solution:

The option (d) is correct answer.

It can be written as $(-29) + 5 = -(29 - 5) = -24$

10. $|-|-7| - 3|$ is equal to
(a) -7 (b) 7 (c) 10 (d) -10

Solution:

The option (c) is correct answer.

It can be written as $|-|-7| - 3| = |-7 - 3| = |-10| = 10$

11. The successor of -22 is
(a) -23 (b) -21 (c) 23 (d) 21

Solution:

The option (b) is correct answer.

We know that if 'a' is an integer $a + 1$ is its successor.

So the successor of $-22 = -22 + 1 = -(22 - 1) = -21$

12. The predecessor of -14 is
(a) -15 (b) 15 (c) 13 (d) -13

Solution:

The option (a) is correct answer.
The predecessor of -14 is -15 .

13. If the sum of two integers is -26 and one of them is 14 , then the other integer is

- (a) -12 (b) 12 (c) -40 (d) 40

Solution:

The option (c) is correct answer.
It is given that the sum of two integers $= -26$
One of them $= 14$
So the other integer $= -26 - 14 = -(26 + 14) = -40$

14. Which of the following pairs of integers have 5 as a difference?

- (a) $10, 5$ (b) $-10, -5$ (c) $15, -20$ (d) both (a) and (b)

Solution:

The option (d) is correct answer.
Consider option (a) $10 - 5 = 5$
Consider option (b) $(-5) - (-10) = -5 + 10 = 5$
Consider option (c) $15 - (-20) = 15 + 20 = 35$

15. If the product of two integers is 72 and one of them is -9 , then the other integers is

- (a) -8 (b) 8 (c) 81 (d) 63

Solution:

The option (a) is correct answer.
It is given that the product of two integers $= 72$
One of them $= -9$
Hence, the other integers $= 72 \div (-9) = -8$

16. On subtracting -7 from -14 , we get

- (a) -12 (b) -7 (c) -14 (d) 21

Solution:

The option (b) is correct answer.
It can be written as
Required number $= -14 - (-7) = -14 + 7 = -(14 - 7) = -7$

17. The largest number that divides 64 and 72 and leave the remainders 12 and 7 respectively, is

- (a) 17 (b) 13 (c) 14 (d) 18

Solution:

The option (b) is correct answer.
By subtracting 12 and 7 from 64 and 72
We get
 $64 - 12 = 52$ and $72 - 7 = 65$
So the required number is the HCF of 52 and 65 .
It can be written as
 $52 = 4 \times 13$ and $65 = 5 \times 13$
HCF of 52 and $65 = 13$

Hence, the largest number that divides 64 and 72 and leave the remainders 12 and 7 respectively, is 13.

18. The sum of two integers is -23 . If one of them is 18, then the other is

- (a) -14 (b) 14 (c) 41 (d) -41

Solution:

The option (d) is correct answer.

It is given as the sum of two integers = -23

One of them = 18

So the other number = $(-23) - (18) = -23 - 18 = -(23 + 18) = -41$

Hence, the other number is -41 .

19. The sum of two integers is -35 . If one of them is 40, then the other is

- (a) 5 (b) -75 (c) 75 (d) -5

Solution:

The option (b) is correct answer.

It is given that the sum of two integers = -35

One of them = 40

So the other number = $(-35) - (40) = -35 - 40 = -(35 + 40) = -75$

Hence, the other number is -75 .

20. On subtracting -5 from 0, we get

- (a) -5 (b) 5 (c) 50 (d) 0

Solution:

The option (b) is correct answer.

We know that, $0 - (-5) = 0 + 5 = 5$

Hence by subtracting -5 from 0, we obtain 5.

21. $(-16) + 14 - (-13)$ is equal to

- (a) -11 (b) 12 (c) 11 (d) -15

Solution:

The option (c) is correct answer.

It can be written as $(-16) + 14 - (-13) = (-16) + 14 + 13 = (-16) + 27 = 27 - 16 = 11$

22. $(-2) \times (-3) \times 6 \times (-1)$ is equal to

- (a) 36 (b) -36 (c) 6 (d) -6

Solution:

The option (b) is correct answer.

It can be written as $(-2) \times (-3) \times 6 \times (-1) = (2 \times 3) \times 6 \times (-1) = 6 \times 6 \times (-1) = 36 \times (-1)$

So we get $(-2) \times (-3) \times 6 \times (-1) = -(36 \times 1) = -36$

23. $86 + (-28) + 12 + (-34)$ is equal to

- (a) 36 (b) -36 (c) 6 (d) -6

Solution:

The option (a) is correct answer.

It can be written as $86 + (-28) + 12 + (-34) = 86 + (-28) - (34 - 12) = 86 + (-28) - 22$

On further calculation

$$86 + (-28) + 12 + (-34) = (86 - 28) - (34 - 12) = (86 - 28) - 22 = 58 - 22 = 36$$

24. $(-12) \times (-9) - 6 \times (-8)$ is equal to

(a) 156

(b) 60

(c) -156

(d) -60

Solution:

The option (a) is correct answer.

It can be written as $(-12) \times (-9) - 6 \times (-8) = (12 \times 9) - 6 \times (-8) = 108 - 6 \times (-8)$

On further calculation

$$(-12) \times (-9) - 6 \times (-8) = 108 + 6 \times 8 = 108 + 48 = 156$$

