EXERCISE-01

Multiple Choice Questions

1. Which set of integers is written in ascending order?
(1) 112, –200, 315, –48
(2) –64, –101, –260
(3) –361, –316, –163, –136
(4) 45, 80, –100, –125

2. The successor of –18 is
(1) –19 (2) 17
(3) –17 (4) 19

3. The predecessor of – 16 is
(1) –15 (2) –17
(3) 15 (4) 17

4. The additive inverse of –5 is
(1) 5 (2) 0
(3) –4 (4) –6

5. On subtracting –8 from 0, we get
(1) –8 (2) 8
(3) 0 (4) None of these

6. (6) + 4 – (–3) = ?
(1) –5 (2) –1
(3) 1 (4) 13

7. The sum of two integers is 20. If one of them is –5, then the other is
(1) 25 (2) –25
(3) 15 (4) None of these

8. Paper was invented in China one thousand nine hundred years ago. Which integer represents this date?
(1) 1000 (2) 1090
(3) –1900 (4) –19000

9. The following were the temperatures recorded at 5 different places around the world on the same day: 20°C, 10°C, –15°C, –1°C and 2°C. The temperature closest to 0°C is
(1) 2°C (2) –20°C
(3) –1°C (4) 10°C

10. A submarine is at a depth of 8 m below sea level, a diver at a depth of 5 m below sea level and a helicopter at a height of 100 m above sea level. Which of the following is in between the other two?
(1) Submarine (2) Diver
(3) Helicopter (4) None

11. A Humpback while swimming on the water's surface dives 250 m. It then dives another 75 m. Which expression represents this situation?
(1) –75 + 250 (2) –250 + (–75)
(3) –250 + 75 (4) 250 + 75

12. A car was driven 50 km due north of Delhi and then 70 km due South. How far from Delhi was the car finally?
(1) 120 km due South
(2) 20 km due North
(3) 120 km due North
(4) 20 km due South

13. If the deepest point in the sea is 11,600 m below sea level and the highest mountain top is 8846 metres above sea level, then the difference in these elevations is.....
(1) 2754 m (2) 20,446 m
(3) 21,406 m (4) 2952 m

14. If p and q are two integers such that p is the predecessor of q, then p – q is equal to
(1) 1 (2) 0
(3) 2 (4) –1

15. Which of the following is false?
(1) –1 < –2 (2) 79 < 89
(3) –1 < 1 (4) 1 > 0

True or false

1. The opposite of zero is zero.

2. Every negative integer is less than every natural number.

3. The successor of –187 is –188.

4. The sum of an integer and its negative is zero.

5. – 15 is on the left of –40.

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

7. (–8) + (–5) = 13

8. The integers between –1 and 1 are 2 and –2.

9. Zero is neither negative nor positive integer.

10. The predecessor of –50 is –49.

Fill in the blanks

In the question 1 to 10, fill in the blanks using <, = or >.

1. (–3) +(–7).....(–3) – (–7)

2. (–23) – (–23).....(–23) + (–23)

3. –(30) – 30.....–30 + 30

4. (–15) + (–25).....(–25) – 15

5. Opposite of +35 is _____.

6. The number next to the +35 on right is _____.

7. Zero is larger than every _____ integer and smaller than every _____integer.

8. On the number line negative integers are on the _____ of zero.

9. –80 + 0 + (–90) = _____ .

10. Integers between –25 and –20 are _____

ANSWER KEY

Multiple choice questions

Question	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Answer	3	3	2	1	2	4	1	3	3	2	2	4	2	4	1

True or false

1. True **2.** True **3.** False **4.** True

5. False **6.** True **7.** False **8.** False

9. True **10.** False

Fill in the blanks

1. < **2.** > **3.** < **4.** =

5. –35 **6.** +36 **7.** negative, positive **8.** left

9. < **10.** – 24, – 23, – 22, – 21

EXERCISE-02

Very short answer type questions

1. (A) Answer the following questions :-
   (i) Which integer represents the opposite of "A profit of Rs 35"?
   (ii) Which odd integer lies between –7 and –3?
   (iii) Which is the least non-negative integer ?
   (iv) Which integer is 5 less than 0 ?
   (v) What is the value of 4 + (–4) + 4 + (–4) ?
   (B) Which one of the following integers in each set has an opposite with least value :
   (i) 4, 5, –9, –16, 0, 25
   (ii) 415, –248, –451, 348, –638, 525
   (C) Which one of the following integers in each set has an opposite with greatest value :
   (i) –666, –61, 965, –766, 1048, 0
   (ii) 14, 84, –35, 100, 97, –48

2. Use the number line and add the following integers.
   (i) –5 + 7 (ii) 5 + (–9)
   (iii) 8 + (–8) (iv) (–3) + (–8)
   (v) –1 + (–2) + 2
   (vi) (–2) + (–4) + (–5)

3. Add without using the number line.
   (i) –8 , –4 (ii) 5, –4
   (iii) –17, + 24 (iv) 0, –36
   (v) 27, –27 (vi) –692, 258
   (vii) 4004, –999 (viii) –1430,0
   (ix) 5987, –5987 (x) 3958, –3959
   (xi) –712, 2538, 712
   (xii) –729, –7098, 729, –2

4. Find the sum
   (i) 200 + (–55) + (–77) + (–68)
   (ii) 1393 + (–407) + (–872) + 690
   (iii) 703 + (–3) + (–1) + 1 + (–400) + 0
   (iv) 2000 + 516 + (–517) – 1999

5. Subtract the sum of :
   (i) –340 and 170 from –45
   (ii) 865 and –493 from the difference of –380 and 675

6. Find :
   (i) 5 – 9 (ii) 2 – (–7)
   (iii) –11 – (–9) (iii) 15 – (–25)
   (v) 0 – 75 (vi) 0 – (–45)

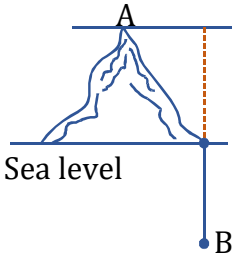
Short answer type questions

7. Find the value of
   (i) –8 – (–15) – 10 (ii) 6 – 7 – (–23)
   (iii) (3 – 4) + (3 – 4)
   (iv) – 60 – (–58) – (–2)
   (v) 19 – [(–4) – 17]

8. Subtract –6 from 9. Subtract 9 from –6. Are the two results the same?

Long answer type questions

9. The point A is on a mountain which is 5700 metres above sea level and the point B is in a mine which is 39600 metres below sea level. Find the vertical distance between A and B.



10. On a day in Srinagar, the temperature at 6 p.m. was 1°C but at midnight that day, it dropped to –4°C. By how many degrees Celsius did the temperature fall?

11. Vinod choose a number that is smaller than –7, larger than –10 and is even. What number did Vinod choose?

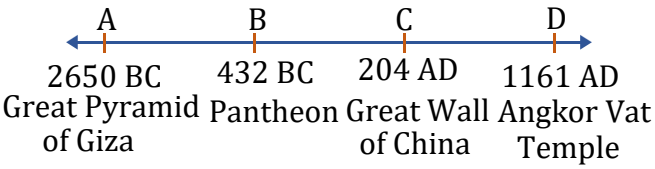
12. During manoeuvers on a space walk, an astronauts' pulse rate first rose 48 beats per minute, then fell 15 beats per minute, rose 32 beats per minute and after the astronauts' return to the capsule fell 50 beats per minute. The net change in his pulse rate is.

13. A diver is at a depth of 8 m below sea level and a balloon is at a height of 8m above sea level. Which is closer to sea level ?

14. What is the opposite of integers 4 units away from –9? Use the number line.

15. Find 1 – 2 + 3 – 4 + 5 – 6 +.....+ 17 – 18 + 19 – 20.

16. The construction dates of significant landmarks are given below. AD is represented by positive integers and BC by negative integers.



Write the following differences in ascending order

(A – D), (C – B), (D – C), (C – D), (A – C)

17. If * is an operation on integers such that for integers a and b, a * b = a – b – (–3), then 2 * (–5) is equal to.

18. Find two integers whose sum is 2 and difference is 8.

19. The temperature on one January day in Delhi was –10 degrees Celsius. Tell whether this temperature is cooler or warmer than –5 degrees Celsius.

20. The temperature at 4 P.M. on February 2nd was –10° Celsius. By 11 P.M. the temperature had risen by 12 degrees. Find the temperature at 11 P.M.

ANSWER KEY

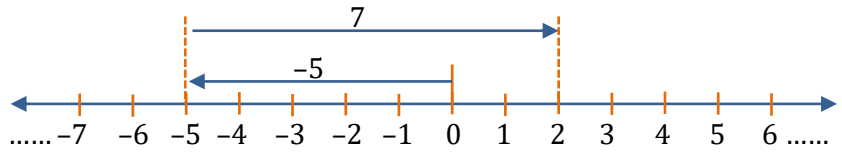
Very short answer type questions

1. (A) (i) –35 (ii) –5 (iii) 0 (iv) –5
(v) 0

(B) (i) 25 (ii) 525

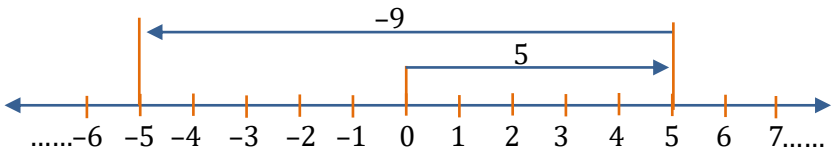
(C) (i) –766 (ii) –48

2. (i)



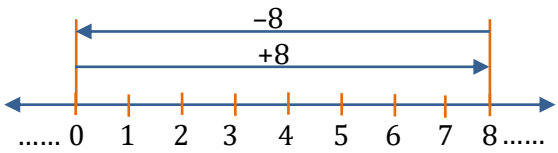
–5 + 7 = 2

(ii)



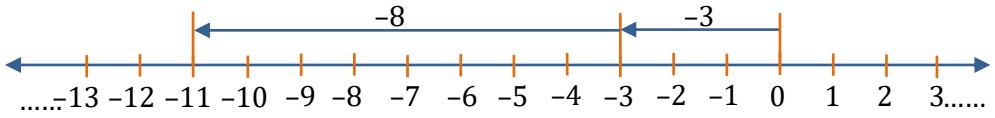
5 + (–9) = –4

(iii)



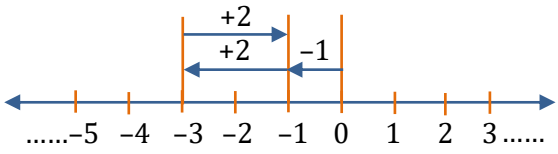
8 + (–8) = 0

(iv)



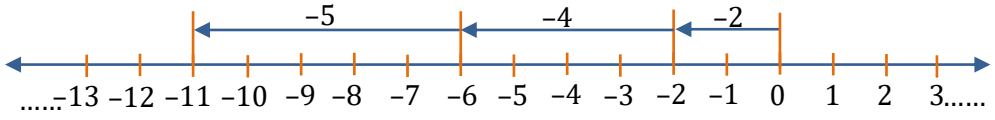
(–3) + (–8) = –11

(v)



–1 + (–2) + 2 = –1

(vi)



(–2) + (–4) + (–5) = –11

3. (i) –12 (ii) 1 (iii) 7 (iv) –36
(v) 0 (vi) –434 (vii) 3005 (viii) –1430
(ix) 0 (x) –1 (xi) 2538 (xii) –7100

4. (i) 0 (ii) 804 (iii) 300 (iv) 0

5. (i) 125 (ii) –1427

6. (i) –4 (ii) 9 (iii) –2 (iv) 40
(v) –75 (vi) 45

Short answer type questions

7. (i) –3 (ii) 22 (iii) –2 (iv) 0
(v) 40

8. 9 – (–6) = 15, –6 – 9 = –15 The results are not equal.

Long answer type questions

9. 45300 m **10.** 5°C **11.** –8

12. Rise of 15 beats per minute

13. Both are at the same distance from the sea level.

14. 13 **15.** –10 **16.** A – D, A – C, C – D, C – B, D – C

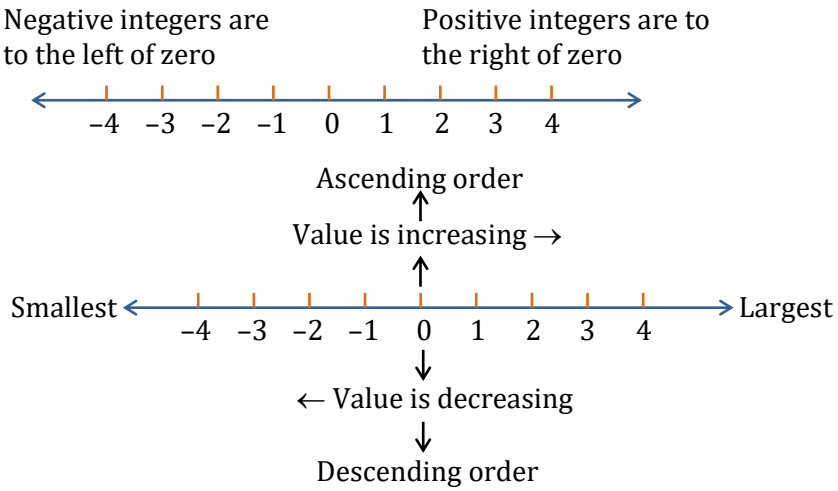
17. 10 **18.** 5, –3 **19.** Cooler **20.** 2°C

Exercise-01 Solutions

Multiple choice questions

1. Option (3)

The collection of negative whole numbers along with the collection of whole numbers are known as integers.



$-361 < -316 < -163 < -136$

2. Option (3)

The successor of a whole number is the number obtained by adding 1 to it.

It is observed that every whole number has its successor

$\therefore$ successor of $-18 = (-18) + 1$

$\Rightarrow -18 + 1 = -17$

3. Option (2)

The predecessor of a whole number is one less than the given number.

But "0" is the only whole number that does not have any predecessor.

$\therefore$ Predecessor of -16 is $\Rightarrow -16 - 1 = -17$

4. Option (1)

Additive inverse : The sum of an integer and its opposite is "0" (zero).

$\therefore$ Additive inverse of -5 is :

$x + (-5) = 0$

$\therefore x - 5 = 0; x = 5$ (Transposing -5 on RHS)

5. Option (2)

Subtract -8 from 0 i.e.,

$= 0 - (-8)$

$= 0 + 8$ $\quad [\because (-) \times (-) = (+)]$

$= +8$

6. **Option (4)**

(6) + 4 – (–3)

= 6 + 4 + 3 [∵ (–) × (–) = (+)] and we will apply BODMAS to solve.

= 10 + 3 =13

7. **Option (1)**

Given that the sum of two integers = 20

One of them = – 5

Let the other integer be "x"

∴ According to question :

⇒ x + (–5) = 20 [(+) × (–) = (–)]

⇒ x – 5 = 20

⇒ x = 20 + 5 [Transposing –5 on RHS]

⇒ x = 25

8. **Option (3)**

Paper was invented in China one thousand nine hundred years ago i.e.

1 × 1000 + 9 × 100 = 1000 + 900 = 1900

and if we use ago, so to denote this we use a –ve sign = –1900

9. **Option (3)**

Temperatures at 5 different places

+20°C, +10°C, –15°C, –1°C and 2°C

So, the temperature closest to 0°C is –1°C.

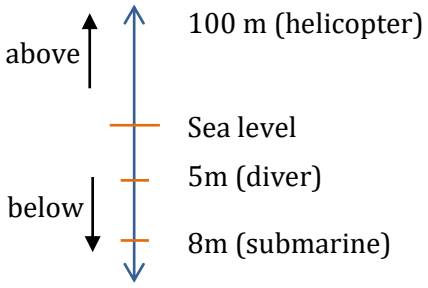
10. **Option (2)**

Depth of submarine below sea level = 8 m

Depth of diver below sea level = 5m

Height of helicopter above sea level = 100 m

Diver is in between helicopter and submarine.



11. **Option (2)**

Diving here will be represented in the form of a negative sign.

So, hump back dives 250 m then he dives another 75 m.

i.e. (–250 m) + (–75) m

12. **Option (4)**

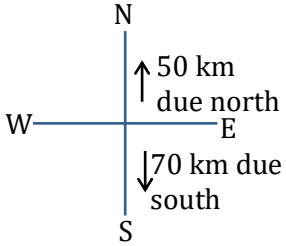
50 km north of Delhi 70 km due south of Delhi

⇒ ∴ car was (50) + (–70) km for from Delhi.

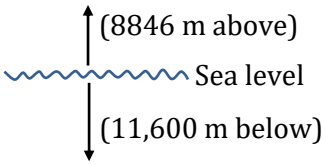
i.e., 50 + (–70)

= 50 –70

= – 20



13. **Option (2)**



Let the distance above sea level be positive, below sea level will be negative. They are on opposite side of sea level.
Deepest point = 11, 600 m below the sea level
Highest mountain top = 8846 m above the sea level
Difference in elevations
= (8846 – (–11600) m
= 20446 m
∴ 20446 is the correct answer.

14. **Option (4)**

Predecessor of q = p
q – 1 = p
p – q = – 1

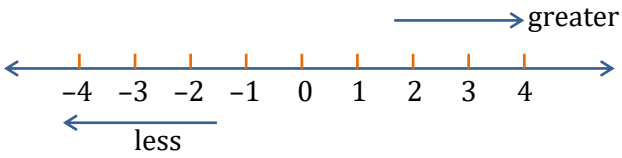
15. **Option (1)**

(1) –1 < –2 (False) (2) 79 < 89 (True)
(3) –1 < 1 (True) (4) 1 > 0 (True)

True or false

1. True

2. True



3. False
Successor of –187 = – 187 + 1 = – 186,

4. True
a + (–a) = 0
(–a) + (a) = 0

5. False
– 15 is on the right of – 40.
because – 40 < –15

6. True

7. False
(–8) + (–5) = –8 – 5 = – 13 ≠ 13

8. False
between –1 and 1 is zero

9. True

10. False
–50 –1 = – 51 ≠ –49

Fill in the blanks

1. $(-3) + (-7) = (-3) - (-7) = -10$;

$(-3) - (-7) = -3 + 7 = 4$

$\Rightarrow -10 < 4$

2. $(-23) + (23) > -23 - 23$

$0 > -46$

3. $-30 - 30 < -30 + 30$

4. $-15 - 25 = -25 - 15$

5. -35

6. $+35 + 1 = +36$

7. 0 > negative integer and positive integer > 0

8. left

9. $-10 < 5$.

10. $-24, -23, -22, -21$

Exercise-02 Solutions

1. (A) (i) Opposite of A profit of Rs 35 is loss of Rs 35 i.e.

+35 $\longrightarrow$ its opposite is –35.

(ii) Odd integer is those which are not divisible by 2 $\Rightarrow$ {–7, –6, **–5**, –4, –3}

So, odd integer in between –7 and –3 is –5.

(iii) Non-negative integer are the positive integers including zero.

$\therefore$ least $\Rightarrow$ 0

(iv) 5 less than 0 $\Rightarrow$ 0 – 5 = – 5

(v) 4 + (–4) + 4 + (–4)

= 4 – 4 + 4 – 4 = 8 – 8 = 0

(B) (i) Opposite of 4 = – 4

Opposite of 5 = – 5

Opposite of –9 = +9

Opposite of –16 = +16

Opposite of 0 = 0

Opposite of 25 = –25

–25 is the integer with the least value.

i.e., opposite of 25

(ii) 415, –248, –451, 348, –638, 525

Opposite of 415 = –415

Opposite of –248 = 248

Opposite of –451 = 451

Opposite of 348 = –348

Opposite of –638 = 638

Opposite of 525 = –525

Least value = –525 i.e., opposite of 525

(C) (i) –666, –61, 965, –766, 1048, 0

Opposites are

666, 61, –965, 766, –1048, 0

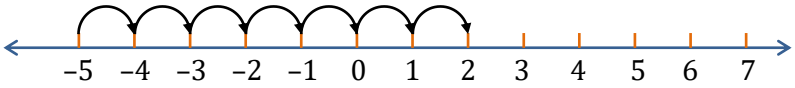
$\therefore$ Integer with the greatest value = 766 i.e. of –766

(ii) 14, 84, –35, 100, 97, –48

$\Rightarrow$ Opposites are : –14, –84, –35, –100, –97, 48

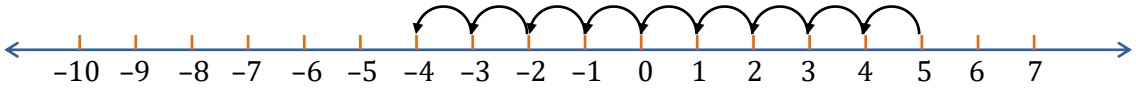
Integer with the greatest value = 48 i.e. of –48

2. (i)

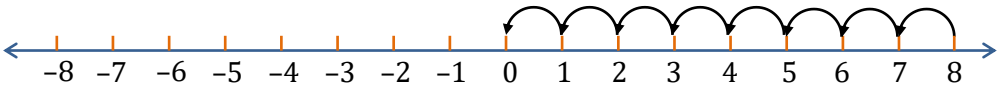


$\therefore -5 + 7$

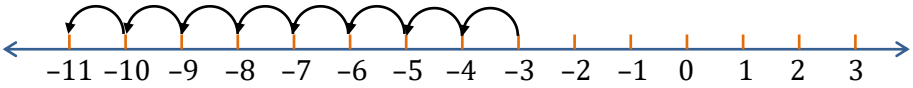
(ii) $5 + (-9)$



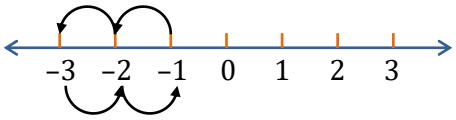
(iii) $8 + (-8)$



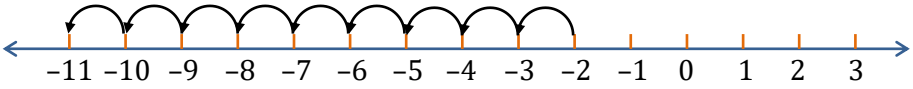
(iii) $8 + (-8)$



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



(vi) $(-2) + (-4) + (-5)$



3. (i) $(-8) + (-4) \Rightarrow -8 - 4$

$\Rightarrow -12$ [Sign in the result will be of integer which has the larger absolute value before the operation]

(ii) 5, −4

$= 5 + (-4)$

$= 5 - 4 = +1$

(iii) $-17 + 24$

$= 24 - 17$

$= +7$

(iv) $0 + (-36)$

$= 0 - 36$

$= -36$

(v) 27, −27

$= 27 + (-27)$

$= 0$

(vi) −692, 258

$= (-692) + 258$

$= -692 + 258$

$= -434$

(vii) 4004, –999

= 4004 + (–999)

= 4004 –999

= 3005

(viii) –1430,0

= –1430 + 0 = –1430

(ix) 5987, –5987

= 5987 + (–5987)

= 5987 –5987

= 0

(x) 3958, –3959

= 3958 + (–3959)

= 3958 –3959

= –1

(xi) –712, 2538 + 712

= (–712) + (2538) + (712)

= 0 + 2538

= 2538

(xii) –729, –7098, 729, –2

= (–729) + (–7098) + (729) + (–2)

= –729 – 7098 + 729 – 2

= –729 – 729 + –7098 – 2

= 0 – 7100

= 7100

4. (i) 200 + (–55) + (–77) + (–68)

= 200 – 55 – 77 – 68

= 200 – 200

= 0

(ii) 1393 + (–407) + (–872) + 690

= 1393 – 407 – 872 + 690

= 1393 + 690 – 407 – 872

= 2083 – 1279

= 804

(iii) 703 + (–3) + (–1) + 1 + (–400) + 0

= 703 – 3 – 1 + 1 – 400 + 0

= 703 – 3 + 0 – 400 + 0

= 703 – 403

= 300

(iv) 2000 + 516 + (–517) – 1999

= 2000 + 516 –517 – 1999

= 2000 – 1999 + 516 – 517

= 1 + (–1)

= 1 –1 = 0

5. (i) –340 and 170 from –45

sum of –340 and 170 = –340 + (170)

= – 170

subtract – 170 from –45

= – 45 – (–170) = – 45 + 170 = 170 – 45 = 125

(ii) Sum of 865 and – 493

865 + (–493) = 865 – 493 = 372

Difference of –380 and 675

= –675 + (–380) = –(675 + 380) = –1055

$\therefore$ Subtract 372 from –1055

= –1055 – (372) = – 1055 – 372 = –1427

6. (i) 5 – 9

= –4

(ii) 2 – (–7)

= 2 + 7 = 9

(iii) –11 – (–9)

= –11 + 9

= – 2

(iv) 15 – (–25)

= 15 + 25

= 40

(v) 0 – 75

= –75

(vi) 0 – (–45)

= 0 + 45

= 45

7. (i) –8 – (–15) – 10

=–8 + 15 – 10

= –8 –10 + 15

= –18 +15 = –3

(ii) 6 – 7 – (–23)

= 6 – 7 + 23

= – 1 + 23

= 22

(iii) (3 – 4) + (3 – 4)

= 3 – 4 + 3 – 4

= 6 – 8

= – 2

(iv) – 60 – (–58) – (–2)

= – 60 + 58 + 2

= – 60 + 60 = 0

(v) 19 – [(–4) – 17]

= 19 – [–4 – 17]

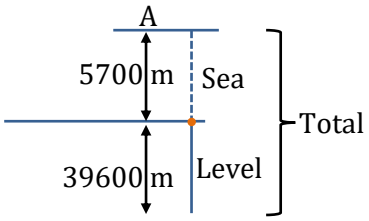
= 19 – (–21)

= 19 + 21 = 40

8. 9 – (–6) = 9 + 6 = 15

No, both results are different

9.



Distance between

A and B = 5700 – (–39600)

= 5700 + 39600

= 45300 m

10. Temperature at 6 pm = 1°C

Temperature at 12 pm = –4°C

∴ Temperature fall = 1 – (–4) = 1 + 4

= 5°C

11. Number is smaller than –7 and it is larger than –10 and it is even.

∴ Numbers between –7 and – 10 is –7, –8, –9, –10.

Here –8 and –9 are smaller than –7 and larger than –10.

But –8 is even.

Vinod choose –8.

12. Pulse rate first rose = 48 beats per minute

Then fell = 15 beats per minute

Then rose = 32 beats per minute

Then fell = 50 beats per minute.

∴ Net change in pulse rate = 48 – 15 + 32 – 50

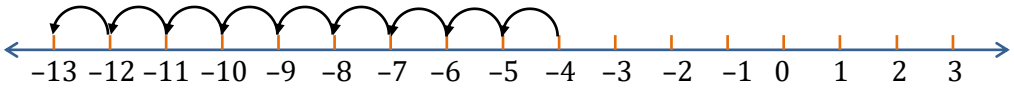
= 48 + 32 – 15 – 50

= 80 – 65 = +15

∴ Rise of 15 beats per minute.

13. Depth = 8m below sea level
Height = 8m above sea level
$\therefore$ +8 – 8 = 0. It is at the same distance from sea level.

14. 4 units away from –9 = – 9 – 4 = –13
Its opposite is +13.



15. 1 – 2 + 3 – 4 + 5 – 6 +.....+ 17 – 18 + 19 – 20.
(1 + 3 + 5 + 7 + 9 + 11 + 13 + 15 + 17 + 19) – (2 + 4 + 6 + 8 + 10 + 12 + 14 + 16 + 18 + 20)
or we can write it as :
= (1 – 2) + (3 – 4) + (5 – 6) + (7 – 8) + (9 –10) + (11 – 12) + (13 – 14) + (15 – 16) + (17 – 18) + (19 – 20)
= (–1) + (–1) + (–1) + (–1) + (–1) + (–1) + (–1) + (–1) + (–1) + (–1)
= –10

16. A = – 2650, B = –432, C = +204, D = +1161
$\therefore$ A – D = – 2650 – 1161 = – 3811
C – B = 204 – (–432) = 636
D – C = 1161 – 204 = 957
C – D = 204 – 1161 = – 957
A – C = – 2650 – 204 = – 2854
$\therefore$ (A – D) < (A – C) < (C – D) < (C – B) < (D – C)

17. a * b = a + (–b) – (–3)
then 2 * (–5) = 2 + [–(–5)] – (–3)
= 2 + 5 + 3
= 7 + 3 = 10

18. a + b = 2 .....(1)
a – b = 8 .....(2)
adding eq. (1) and (2) $\Rightarrow$ (a + b) + (a – b) = 2 + 8
2a = 10
a = 5
value of a put in eq. (1)
5 + b = 2
b = 2 – 5
b = – 3

19. Temperature on 1 Jan in Delhi = – 10°C
This temperature is warmer than +5°C and this temperature is cooler than –5°C.

20. Temperature at 4.P.M. = –10°C
Temperature had risen = +12°C
$\therefore$ Temperature at 11 PM = (12 – 10)°C = 2°C