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 – 709 we get
= - (-2700) + (-709)
On further calculation
= - 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
Sum of two integers = 238
One of the integers = - 122
So the other integer = - (-122) + 138
On further calculation
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
Sum of two integers = - 223
One of the integers = 172
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 + …… + 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
By calculation
= - 8

10. Calculate the sum:
5 + (-5) + 5 + (-5) + …..
(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 △ is an operation on integers such that a △ b = - a + b – (-2) for all integers a, b. Find the value of
(i) 4 △ 3
(ii) (-2) △ (-3)
(iii) 6 △ (-5)
(iv) (-5) △ 6
Solution:

(i) 4 △ 3
By substituting values in a △ b = - a + b – (-2)
We get
4 △ 3 = - 4 + 3 – (-2) = 1

(ii) (-2) △ (-3)

By substituting values in a △ b = - a + b – (-2)
We get
(-2) △ (-3) = - (-2) + (-3) – (-2) = 1

(iii) 6 △ (-5)
By substituting values in a △ b = - a + b – (-2)
We get
6 △ (-5) = - 6 + (-5) – (-2) = - 9

(iv) (-5) △ 6
By substituting values in a △ b = - a + b – (-2)
We get
(-5) △ 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 + ….. = 0
(ii) 29 + ….. = 0
(iii) 132 + (-132) = ….
(iv) – 14 + ….. = 22
(v) – 1256 + ….. = - 742
(vi) ….. – 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