EXERCISE 5.3

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 = - 42 + (-1)
We get
= 1 – 42 = - 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), (3, - 3), (2, - 2), (1, - 1), (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