EXERCISE 5.2 PAGE NO: 5.7

1. Subtract the first rational number from the second in each of the following:
(i) (3/8), (5/8)
(ii) (-7/9), (4/9)
(iii) (-2/11), (-9/11)
(iv) (11/13), (-4/13)

Solution:
(i) Given (3/8), (5/8)
(5/8) – (3/8) = (5 – 3)/8
= (2/8)
= (1/4)

(ii) Given (-7/9), (4/9)
(4/9) – (-7/9) = (4/9) + (7/9)
= (4 + 7)/9
= (11/9)

(iii) Given (-2/11), (-9/11)
(-9/11) – (-2/11) = (-9/11) + (2/11)
= (-9 + 2)/ 11
= (-7/11)

(iv) Given (11/13), (-4/13)
(-4/13) – (11/13) = (-4 – 11)/13
= (-15/13)

2. Evaluate each of the following:
(i) (2/3) – (3/5)
(ii) (-4/7) – (2/-3)
(iii) (4/7) – (-5/-7)
(iv) -2 – (5/9)

Solution:
(i) Given (2/3) – (3/5)
The LCM of 3 and 5 is 15

Consider (2/3) = (2/3) × (5/5) = (10/15)
Now again (3/5) = (3/5) × (3/3) = (9/15)
(2/3) – (3/5) = (10/15) – (9/15)
= (1/15)

(ii) Given (-4/7) – (2/-3)
The LCM of 7 and 3 is 21
Consider (-4/7) = (-4/7) × (3/3) = (-12/21)
Again (2/-3) = (-2/3) × (7/7) = (-14/21)
(-4/7) – (2/-3) = (-12/21) – (-14/21)
= (-12 + 14)/21
= (2/21)

(iii) Given (4/7) – (-5/-7)
(4/7) – (5/7) = (4 -5)/7
= (-1/7)

(iv) Given -2 – (5/9)
Consider (-2/1) = (-2/1) × (9/9) = (-18/9)
-2 – (5/9) = (-18/9) – (5/9)
= (-18 -5)/9
= (-23/9)

3. The sum of the two numbers is (5/9). If one of the numbers is (1/3), find the other.

Solution:
Given sum of two numbers is (5/9)
And one them is (1/3)
Let the unknown number be x
x + (1/3) = (5/9)
x = (5/9) – (1/3)
LCM of 3 and 9 is 9
Consider (1/3) = (1/3) × (3/3) = (3/9)
On substituting we get
x = (5/9) – (3/9)
x = (5 – 3)/9
x = (2/9)

4. The sum of two numbers is (-1/3). If one of the numbers is (-12/3), find the other.

Solution:
Given sum of two numbers = (-1/3)
One of them is (-12/3)
Let the required number be x
x + (-12/3) = (-1/3)
x = (-1/3) – (-12/3)
x = (-1/3) + (12/3)
x = (-1 + 12)/3
x = (11/3)

5. The sum of two numbers is (– 4/3). If one of the numbers is -5, find the other.

Solution:
Given sum of two numbers = (-4/3)
One of them is -5
Let the required number be x
x + (-5) = (-4/3)
LCM of 1 and 3 is 3
(-5/1) = (-5/1) × (3/3) = (-15/3)
On substituting
x + (-15/3) = (-4/3)
x = (-4/3) – (-15/3)
x = (-4/3) + (15/3)
x = (-4 + 15)/3
x = (11/3)

6. The sum of two rational numbers is - 8. If one of the numbers is (-15/7), find the other.

Solution:
Given sum of two numbers is -8
One of them is (-15/7)
Let the required number be x
x + (-15/7) = -8
The LCM of 7 and 1 is 7

Consider (-8/1) = (-8/1) × (7/7) = (-56/7)
On substituting
x + (-15/7) = (-56/7)
x = (-56/7) – (-15/7)
x = (-56/7) + (15/7)
x = (-56 + 15)/7
x = (-41/7)

7. What should be added to (-7/8) so as to get (5/9)?

Solution:
Given (-7/8)
Let the required number be x
x + (-7/8) = (5/9)
The LCM of 8 and 9 is 72
x = (5/9) – (-7/8)
x = (5/9) + (7/8)
Consider (5/9) = (5/9) × (8/8) = (40/72)
Again (7/8) = (7/8) × (9/8) = (63/72)
On substituting
x = (40/72) + (63/72)
x = (40 + 63)/72
x = (103/72)

8. What number should be added to (-5/11) so as to get (26/33)?

Solution:
Given (-5/11)
Let the required number be x
x + (-5/11) = (26/33)
x = (26/33) – (-5/11)
x = (26/33) + (5/11)
Consider (5/11) = (5/11) × (3/3) = (15/33)
On substituting
x = (26/33) + (15/33)
x = (41/33)

9. What number should be added to (-5/7) to get (-2/3)?

Solution:
Given (-5/7)
Let the required number be x
x + (-5/7) = (-2/3)
x = (-2/3) – (-5/7)
x = (-2/3) + (5/7)
LCM of 3 and 7 is 21
Consider (-2/3) = (-2/3) × (7/7) = (-14/21)
Again (5/7) = (5/7) × (3/3) = (15/21)
On substituting
x = (-14/21) + (15/21)
x = (-14 + 15)/21
x = (1/21)

10. What number should be subtracted from (-5/3) to get (5/6)?

Solution:
Given (-5/3)
Let the required number be x
(-5/3) – x = (5/6)
- x = (5/6) – (-5/3)
- x = (5/6) + (5/3)
Consider (5/3) = (5/3) × (2/2) = (10/6)
On substituting
- x = (5/6) + (10/6)
- x = (15/6)
x = (-15/6)

11. What number should be subtracted from (3/7) to get (5/4)?

Solution:
Given (3/7)
Let the required number be x
(3/7) – x = (5/4)
- x = (5/4) – (3/7)

The LCM of 4 and 7 is 28
Consider (5/4) = (5/4) × (7/7) = (35/28)
Again (3/7) = (3/7) × (4/4) = (12/28)
On substituting
-x = (35/28) – (12/28)
- x = (35 -12)/28
- x = (23/28)
x = (-23/28)

12. What should be added to ((2/3) + (3/5)) to get (-2/15)?

Solution:
Given ((2/3) + (3/5))
Let the required number be x
((2/3) + (3/5)) + x = (-2/15)
Consider (2/3) = (2/3) × (5/5) = (10/15)
Again (3/5) = (3/5) × (3/3) = (9/15)
On substituting
((10/15) + (9/15)) + x = (-2/15)
x = (-2/15) - ((10/15) + (9/15))
x = (-2/15) – (19/15)
x = (-2 -19)/15
x = (-21/15)
x = (- 7/5)

13. What should be added to ((1/2) + (1/3) + (1/5)) to get 3?

Solution:
Given ((1/2) + (1/3) + (1/5))
Let the required number be x
((1/2) + (1/3) + (1/5)) + x = 3
x = 3 - ((1/2) + (1/3) + (1/5))
LCM of 2, 3 and 5 is 30
Consider (1/2) = (1/2) × (15/15) = (15/30)
(1/3) = (1/3) × (10/10) = (10/30)
(1/5) = (1/5) × (6/6) = (6/30)
On substituting

x = 3 – ((15/30) + (10/30) + (6/30))
x = 3 – (31/30)
(3/1) = (3/1) × (30/30) = (90/30)
x = (90/30) – (31/30)
x = (90 – 31)/30
x = (59/30)

14. What should be subtracted from ((3/4) – (2/3)) to get (-1/6)?

Solution:
Given ((3/4) – (2/3))
Let the required number be x
((3/4) – (2/3)) – x = (-1/6)
- x = (-1/6) - ((3/4) – (2/3))
Consider (3/4) = (3/4) × (3/3) = (9/12)
(2/3) = (2/3) × (4/4) = (8/12)
On substituting
- x = (-1/6) – ((9/12) – ((8/12))
- x = (-1/6) – (1/12)
(1/6) = (1/6) × (2/2) = (2/12)
- x = (-2/12) – (1/12)
- x = (-2 – 1)/12
- x = (-3/12)
x = (3/12)
x = (1/4)

15. Simplify:
(i) (-3/2) + (5/4) – (7/4)
(ii) (5/3) – (7/6) + (-2/3)
(iii) (5/4) – (7/6) – (-2/3)
(iv) (-2/5) – (-3/10) – (-4/7)

Solution:
(i) Given (-3/2) + (5/4) – (7/4)
Consider (-3/2) = (-3/2) × (2/2) = (-6/4)
On substituting
(-3/2) + (5/4) – (7/4) = (-6/4) + (5/4) – (7/4)

= (-6 + 5 – 7)/4
= (-13 + 5)/4
= (-8/4)
= -2

(ii) Given (5/3) – (7/6) + (-2/3)
Consider (5/3) = (5/3) × (2/2) = (10/6)
(-2/3) = (-2/3) × (2/2) = (-4/6)
(5/3) – (7/6) + (-2/3) = (10/6) – (7/6) – (4/6)
= (10 - 7 – 4)/6
= (10 - 11)/6
= (-1/6)

(iii) Given (5/4) – (7/6) – (-2/3)
The LCM of 4, 6 and 3 is 12
Consider (5/4) = (5/4) × (3/3) = (15/12)
(7/6) = (7/6) × (2/2) = (14/12)
(-2/3) = (-2/3) × (4/4) = (-8/12)
(5/4) – (7/6) – (-2/3) = (15/12) – (14/12) + (8/12)
= (15 – 14 + 8)/12
= (9/12)
= (3/4)

(iv) Given (-2/5) – (-3/10) – (-4/7)
The LCM of 5, 10 and 7 is 70
Consider (-2/5) = (-2/5) × (14/14) = (-28/70)
(-3/10) = (-3/10) × (7/7) = (-21/70)
(-4/7) = (-4/7) × (10/10) = (-40/70)
On substituting
(-2/5) – (-3/10) – (-4/7) = (-28/70) + (21/70) + (40/70)
= (-28 + 21 + 40)/70
= (33/70)

16. Fill in the blanks:
(i) (-4/13) – (-3/26) = …..
(ii) (-9/14) + ….. = -1
(iii) (-7/9) + ….. = 3

(iv) ….. + (15/23) = 4

Solution:
(i) (-5/26)

Explanation:
Consider (-4/13) – (-3/26)
(-4/13) = (-4/13) × (2/2) = (-8/26)
(-4/13) – (-3/26) = (-8/26) – (-3/26)
= (-5/26)

(ii) (-5/14)

Explanation:
Given (-9/14) + ….. = -1
(-9/14) + 1 = ….
(-9/14) + (14/14) = (5/14)
(-9/14) + (-5/14) = -1

(iii) (34/9)

Explanation:
Given (-7/9) + ….. = 3
(-7/9) + x = 3
x = 3 + (7/9)
(3/1) = (3/1) × (9/9) = (27/9)
x = (27/9) + (7/9) = (34/9)

(iv) (77/23)

Explanation:
Given ….. + (15/23) = 4
x + (15/23) = 4
x = 4 – (15/23)
(4/1) = (4/1) × (23/23) = (92/23)
x = (92/23) – (15/23)
= (77/23)