EXERCISE 1.3 **PAGE NO: 1.18**

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
(v) ¼, -3/8
(vi) -2/3, 5/6
(vii) -6/7, -13/14
(viii) -8/33, -7/22
Solution:
(i) let us subtract
5/8 – 3/8
Since the denominators are same we can subtract directly
(5-3)/8 = 2/8
Further we can divide by 2 we get,
2/8 = 1/4

(ii) let us subtract
4/9 – -7/9
Since the denominators are same we can subtract directly
(4+7)/9 = 11/9

(iii) let us subtract
-9/11 – -2/11
Since the denominators are same we can subtract directly
(-9+2)/11 = -7/11

(iv) let us subtract
-4/13 – 11/13
Since the denominators are same we can subtract directly
(-4-11)/13 = -15/13

(v) let us subtract
-3/8 – 1/4
By taking LCM for 8 and 4 which is 8
-3/8 – 1/4 = (-3×1)/(8×1) - (1×2)/(4×2) = -3/8 – 2/8
Since the denominators are same we can subtract directly

(-3-2)/8 = -5/8

(vi) let us subtract
5/6 – -2/3
By taking LCM for 6 and 3 which is 6
5/6 – -2/3 = (5×1)/(6×1) - (-2×2)/(3×2) = 5/6 – -4/6
Since the denominators are same we can subtract directly
(5+4)/6 = 9/6
Further we can divide by 3 we get,
9/6 = 3/2

(vii) let us subtract
-13/14 – -6/7
By taking LCM for 14 and 7 which is 14
-13/14 – -6/7 = (-13×1)/(14×1) - (-6×2)/(7×2) = -13/14 – -12/14
Since the denominators are same we can subtract directly
(-13+12)/14 = -1/14

(viii) let us subtract
-7/22 – -8/33
By taking LCM for 22 and 33 which is 66
-7/22 – -8/33 = (-7×3)/(22×3) - (-8×2)/(33×2) = -21/66 – -16/66
Since the denominators are same we can subtract directly
(-21+16)/66 = -5/66

2. Evaluate each of the following:
(i) 2/3 – 3/5
Solution: By taking LCM for 3 and 5 which is 15
2/3 – 3/5 = (2×5 - 3×3)/15
        = 1/15

(ii) -4/7 – 2/-3
Solution: convert the denominator to positive number by multiplying by -1
2/-3 = -2/3
-4/7 – -2/3
By taking LCM for 7 and 3 which is 21
-4/7 – -2/3 = (-4×3 - -2×7)/21
        = (-12+14)/21
        = 2/21

(iii) 4/7 - -5/-7
Solution: convert the denominator to positive number by multiplying by -1
-5/-7 = 5/7
4/7 – 5/7
Since the denominators are same we can subtract directly
(4-5)/7 = -1/7

(iv) -2 – 5/9
Solution: By taking LCM for 1 and 9 which is 9
-2/1 – 5/9 = (-2×9 - 5×1)/9
            = (-18 - 5)/9
            = -23/9

(v) -3/-8 - -2/7
Solution: convert the denominator to positive number by multiplying by -1
-3/-8 = 3/8
3/8 – -2/7
By taking LCM for 8 and 7 which is 56
3/8 – -2/7 = (3×7 - -2×8)/56
            = (21 + 16)/56
            = 37/56

(vi) -4/13 - -5/26
Solution: By taking LCM for 13 and 26 which is 26
-4/13 - -5/26 = (-4×2 - -5×1)/26
            = (-8 + 5)/26
            = -3/26

(vii) -5/14 - -2/7
Solution: By taking LCM for 14 and 7 which is 14
-5/14 - -2/7 = (-5×1 - -2×2)/14
            = (-5 + 4)/14
            = -1/14

(viii) 13/15 – 12/25
Solution: By taking LCM for 15 and 25 which is 75
13/15 – 12/25 = (13×5 - 12×3)/75
            = (65 - 36)/75
            = 29/75

(ix) -6/13 - -7/13
Solution: Since the denominators are same we can subtract directly
-6/13 - -7/13 = (-6+7)/13
= 1/13

(x) 7/24 – 19/36
Solution: By taking LCM for 24 and 36 which is 72
7/24 – 19/36 = (7×3 - 19×2)/72
= (21 - 38)/72
= -17/72

(xi) 5/63 - -8/21
Solution: By taking LCM for 63 and 21 which is 63
5/63 - -8/21 = (5×1 - -8×3)/63
= (5 + 24)/63
= 29/63

3. The sum of the two numbers is 5/9. If one of the numbers is 1/3, find the other.
Solution: Let us note down the given details
Sum of two numbers = 5/9
One of the number = 1/3
By using the formula,
Other number = sum of number – given number
= 5/9 – 1/3
By taking LCM for 9 and 3 which is 9
5/9 – 1/3 = (5×1 - 1×3)/9
= (5 - 3)/9
= 2/9
∴ the other number is 2/9

4. The sum of the two numbers is -1/3. If one of the numbers is -12/3, find the other.
Solution: Let us note down the given details
Sum of two numbers = -1/3
One of the number = -12/3
By using the formula,
Other number = sum of number – given number
= -1/3 – -12/3
Since the denominators are same we can subtract directly
= (-1+12)/3 = 11/3

∴ the other number is 11/3

5. The sum of the two numbers is -4/3. If one of the numbers is -5, find the other.
Solution: Let us note down the given details
Sum of two numbers = -4/3
One of the number = -5/1
By using the formula,
Other number = sum of number – given number
= -4/3 – -5/1
By taking LCM for 3 and 1 which is 3
-4/3 – -5/1 = (-4×1 - -5×3)/3
= (-4 + 15)/3
= 11/3
∴ the other number is 11/3

6. The sum of the two rational numbers is -8. If one of the numbers is -15/7, find the other.
Solution: Let us note down the given details
Sum of two rational numbers = -8/1
One of the number = -15/7
Let us consider the other number as x
x + -15/7 = -8
(7x -15)/7 = -8
7x -15 = -8×7
7x – 15 = -56
7x = -56+15
x = -41/7
∴ the other number is -41/7

7. What should be added to -7/8 so as to get 5/9?
Solution: Let us consider a number as x to be added to -7/8 to get 5/9
So, -7/8 + x = 5/9
(-7 + 8x)/8 = 5/9
(-7 + 8x) × 9 = 5 × 8
-63 + 72x = 40
72x = 40 + 63
x = 103/72
∴ the required number is 103/72

8. What number should be added to -5/11 so as to get 26/33?
Solution: Let us consider a number as x to be added to -5/11 to get 26/33
So, -5/11 + x = 26/33
x = 26/33 + 5/11
let us take LCM for 33 and 11 which is 33
x = (26×1 + 5×3)/33
  = (26 + 15)/33
  = 41/33
∴ the required number is 41/33

9. What number should be added to -5/7 to get -2/3?
Solution: Let us consider a number as x to be added to -5/7 to get -2/3
So, -5/7 + x = -2/3
x = -2/3 + 5/7
let us take LCM for 3 and 7 which is 21
x = (-2×7 + 5×3)/21
  = (-14 + 15)/21
  = 1/21
∴ the required number is 1/21

10. What number should be subtracted from -5/3 to get 5/6?
Solution: Let us consider a number as x to be subtracted from -5/3 to get 5/6
So, -5/3 - x = 5/6
x = -5/3 – 5/6
let us take LCM for 3 and 6 which is 6
x = (-5×2 - 5×1)/6
  = (-10 - 5)/6
  = -15/6
Further we can divide by 3 we get,
-15/6 = -5/2
∴ the required number is -5/2

11. What number should be subtracted from 3/7 to get 5/4?
Solution: Let us consider a number as x to be subtracted from 3/7 to get 5/4
So, 3/7 - x = 5/4
x = 3/7 – 5/4
let us take LCM for 7 and 4 which is 28
x = (3×4 - 5×7)/28
  = (12 - 35)/28

= -23/28

∴ the required number is -23/28

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

Solution: Let us consider a number as x to be added to (2/3 + 3/5) to get -2/15

x + (2/3 + 3/5) = -2/15

By taking LCM of 3 and 5 which is 15 we get,

(15x + 2×5 + 3×3)15 = -2/15

15x + 10 + 9 = -2

15x = -2-19

x = -21/15

Further we can divide by 3 we get,

-21/15 = -7/5

∴ the required number is -7/5

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

Solution: Let us consider a number as x to be added to (1/2 + 1/3 + 1/5) to get 3

x + (1/2 + 1/3 + 1/5) = 3

By taking LCM of 2, 3 and 5 which is 30 we get,

(30x + 1×15 + 1×10 + 1×6)30 = 3

30x + 15 + 10 + 6 = 3 × 30

30x + 31 = 90

30x = 90-31

x = 59/30

∴ the required number is 59/30

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

Solution: Let us consider a number as x to be subtracted from (3/4 – 2/3) to get -1/6

So, (3/4 – 2/3) - x = -1/6

x = 3/4 – 2/3 + 1/6

Let us take LCM for 4 and 3 which is 12

x = (3×3 - 2×4)/12 + 1/6

  = (9 - 8)/12 + 1/6

  = 1/12 + 1/6

Let us take LCM for 12 and 6 which is 12

  = (1×1 + 1×2)/12

  = 3/12

Further we can divide by 3 we get,

3/12 = 1/4   ∴ the required number is ¼

15. Fill in the blanks:
(i) -4/13 - -3/26 = ….
Solution:
-4/13 - -3/26
Let us take LCM for 13 and 26 which is 26
(-4×2 + 3×1)/26
(-8+3)/26 = -5/26

(ii) -9/14 + …. = -1
Solution:
Let us consider the number to be added as x
-9/14 + x = -1
x = -1 + 9/14
By taking LCM as 14 we get,
x = (-1×14 + 9)/14
   = (-14+9)/14
   = -5/14

(iii) -7/9 + …. =3
Solution:
Let us consider the number to be added as x
-7/9 + x = 3
x = 3 + 7/9
By taking LCM as 9 we get,
x = (3×9 + 7)/9
   = (27 + 7)/9
   = 34/9

(iv) … + 15/23 = 4
Solution:
Let us consider the number to be added as x
x + 15/23 = 4
x = 4 - 15/23
By taking LCM as 23 we get,
x = (4×23 - 15)/23
   = (92 - 15)/23
   = 77/23