

EXERCISE 1.3

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) $1/4, -3/8$

(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

$$-3/8 - 1/4 = (-3 \times 1)/(8 \times 1) - (1 \times 2)/(4 \times 2) = -3/8 - 2/8$$

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

$$5/6 - -2/3 = (5 \times 1)/(6 \times 1) - (-2 \times 2)/(3 \times 2) = 5/6 - -4/6$$

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

$$-13/14 - -6/7 = (-13 \times 1)/(14 \times 1) - (-6 \times 2)/(7 \times 2) = -13/14 - -12/14$$

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

$$-7/22 - -8/33 = (-7 \times 3)/(22 \times 3) - (-8 \times 2)/(33 \times 2) = -21/66 - -16/66$$

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

$$\begin{aligned} 2/3 - 3/5 &= (2 \times 5 - 3 \times 3)/15 \\ &= 1/15 \end{aligned}$$

(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

$$\begin{aligned} -4/7 - -2/3 &= (-4 \times 3 - -2 \times 7)/21 \\ &= (-12+14)/21 \\ &= 2/21 \end{aligned}$$

(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

$$-2/1 - 5/9 = (-2 \times 9 - 5 \times 1)/9$$

$$= (-18 - 5)/9$$

$$= -23/9$$

(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

$$3/8 - -2/7 = (3 \times 7 - -2 \times 8)/56$$

$$= (21 + 16)/56$$

$$= 37/56$$

(vi) $-4/13 - -5/26$

Solution: By taking LCM for 13 and 26 which is 26

$$-4/13 - -5/26 = (-4 \times 2 - -5 \times 1)/26$$

$$= (-8 + 5)/26$$

$$= -3/26$$

(vii) $-5/14 - -2/7$

Solution: By taking LCM for 14 and 7 which is 14

$$-5/14 - -2/7 = (-5 \times 1 - -2 \times 2)/14$$

$$= (-5 + 4)/14$$

$$= -1/14$$

(viii) $13/15 - 12/25$

Solution: By taking LCM for 15 and 25 which is 75

$$13/15 - 12/25 = (13 \times 5 - 12 \times 3)/75$$

$$= (65 - 36)/75$$

$$= 29/75$$

(ix) $-6/13 - -7/13$

Solution: Since the denominators are same we can subtract directly

$$\begin{aligned} -6/13 - -7/13 &= (-6+7)/13 \\ &= 1/13 \end{aligned}$$

(x) $7/24 - 19/36$

Solution: By taking LCM for 24 and 36 which is 72

$$\begin{aligned} 7/24 - 19/36 &= (7 \times 3 - 19 \times 2)/72 \\ &= (21 - 38)/72 \\ &= -17/72 \end{aligned}$$

(xi) $5/63 - -8/21$

Solution: By taking LCM for 63 and 21 which is 63

$$\begin{aligned} 5/63 - -8/21 &= (5 \times 1 - -8 \times 3)/63 \\ &= (5 + 24)/63 \\ &= 29/63 \end{aligned}$$

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,

$$\begin{aligned} \text{Other number} &= \text{sum of number} - \text{given number} \\ &= 5/9 - 1/3 \end{aligned}$$

By taking LCM for 9 and 3 which is 9

$$\begin{aligned} 5/9 - 1/3 &= (5 \times 1 - 1 \times 3)/9 \\ &= (5 - 3)/9 \\ &= 2/9 \end{aligned}$$

\therefore 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,

$$\begin{aligned} \text{Other number} &= \text{sum of number} - \text{given number} \\ &= -1/3 - -12/3 \end{aligned}$$

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

$$\text{Sum of two numbers} = -4/3$$

$$\text{One of the number} = -5/1$$

By using the formula,

$$\begin{aligned}\text{Other number} &= \text{sum of number} - \text{given number} \\ &= -4/3 - 5/1\end{aligned}$$

By taking LCM for 3 and 1 which is 3

$$\begin{aligned}-4/3 - 5/1 &= (-4 \times 1 - 5 \times 3)/3 \\ &= (-4 + 15)/3 \\ &= 11/3\end{aligned}$$

∴ 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

$$\text{Sum of two rational numbers} = -8/1$$

$$\text{One of the number} = -15/7$$

Let us consider the other number as x

$$x + -15/7 = -8$$

$$(7x - 15)/7 = -8$$

$$7x - 15 = -8 \times 7$$

$$7x - 15 = -56$$

$$7x = -56 + 15$$

$$x = -41/7$$

∴ 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 $5/9$

$$\text{So, } -7/8 + x = 5/9$$

$$(-7 + 8x)/8 = 5/9$$

$$(-7 + 8x) \times 9 = 5 \times 8$$

$$-63 + 72x = 40$$

$$72x = 40 + 63$$

$$x = 103/72$$

∴ 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 $26/33$

$$\text{So, } -5/11 + x = 26/33$$

$$x = 26/33 + 5/11$$

let us take LCM for 33 and 11 which is 33

$$x = (26 \times 1 + 5 \times 3)/33$$

$$= (26 + 15)/33$$

$$= 41/33$$

\therefore 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 $-2/3$

$$\text{So, } -5/7 + x = -2/3$$

$$x = -2/3 + 5/7$$

let us take LCM for 3 and 7 which is 21

$$x = (-2 \times 7 + 5 \times 3)/21$$

$$= (-14 + 15)/21$$

$$= 1/21$$

\therefore 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 $5/6$

$$\text{So, } -5/3 - x = 5/6$$

$$x = -5/3 - 5/6$$

let us take LCM for 3 and 6 which is 6

$$x = (-5 \times 2 - 5 \times 1)/6$$

$$= (-10 - 5)/6$$

$$= -15/6$$

Further we can divide by 3 we get,

$$-15/6 = -5/2$$

\therefore 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 $5/4$

$$\text{So, } 3/7 - x = 5/4$$

$$x = 3/7 - 5/4$$

let us take LCM for 7 and 4 which is 28

$$x = (3 \times 4 - 5 \times 7)/28$$

$$= (12 - 35)/28$$

$$= -23/28$$

∴ 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,

$$(15x + 2 \times 5 + 3 \times 3)15 = -2/15$$

$$15x + 10 + 9 = -2$$

$$15x = -2 - 19$$

$$x = -21/15$$

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,

$$(30x + 1 \times 15 + 1 \times 10 + 1 \times 6)30 = 3 \times 30$$

$$30x + 15 + 10 + 6 = 3 \times 30$$

$$30x + 31 = 90$$

$$30x = 90 - 31$$

$$x = 59/30$$

∴ 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 $-1/6$

$$\text{So, } (3/4 - 2/3) - x = -1/6$$

$$x = 3/4 - 2/3 + 1/6$$

Let us take LCM for 4 and 3 which is 12

$$x = (3 \times 3 - 2 \times 4)/12 + 1/6$$

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

$$= 1/12 + 1/6$$

Let us take LCM for 12 and 6 which is 12

$$= (1 \times 1 + 1 \times 2)/12$$

$$= 3/12$$

Further we can divide by 3 we get,

$$3/12 = 1/4 \quad \therefore \text{the required number is } 1/4$$

15. Fill in the blanks:

(i) $-4/13 - -3/26 = \dots$

Solution:

$$-4/13 - -3/26$$

Let us take LCM for 13 and 26 which is 26

$$(-4 \times 2 + 3 \times 1)/26$$

$$(-8+3)/26 = -5/26$$

(ii) $-9/14 + \dots = -1$

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,

$$x = (-1 \times 14 + 9)/14$$

$$= (-14+9)/14$$

$$= -5/14$$

(iii) $-7/9 + \dots = 3$

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,

$$x = (3 \times 9 + 7)/9$$

$$= (27 + 7)/9$$

$$= 34/9$$

(iv) $\dots + 15/23 = 4$

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,

$$x = (4 \times 23 - 15)/23$$

$$= (92 - 15)/23$$

$$= 77/23$$

