

EXERCISE 2E

Evaluate:

(i) $-2/3 + 3/4$

(ii) $7/-27 + 11/18$

(iii) $-3/8 + -5/12$

(iv) $9/-16 + -5/-12$

(v) $-5/9 + -7/12 + 11/18$

(vi) $7/-26 + 16/39$

(vii) $-2/3 - (-5/7)$

(viii) $-5/7 - (-3/8)$

(ix) $7/26 + 2 + -11/13$

(x) $-1 + 2/-3 + 5/6$

Solution:

(i) $-2/3 + 3/4$

3	3,4
4	1,4
	1,1

Here the LCM of 3 and 4 is 12

So we get

$$= (-2 \times 4) / (3 \times 4) + (3 \times 3) / (4 \times 3)$$

By further calculation

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

$$= 1/12$$

(ii) $7/-27 + 11/18$

2	27,18
3	27,9
3	9,3
3	3,1
	1,1

Here the LCM of 27 and 18 is 54

So we get

$$= (7 \times 2) / (-27 \times 2) + (11 \times 3) / (18 \times 3)$$

By further calculation

$$= (-14 + 33) / 54$$

$$= 19/54$$

(iii) $-3/8 + -5/12$

2	8,12
2	4,6
2	2,3
3	1,3
	1,1

Here LCM of 8 and 12 is 24

So we get

$$= (-3 \times 3) / (8 \times 3) + (-5 \times 2) / (12 \times 2)$$

By further calculation

$$= (-9 - 10) / 24$$

$$= -19/24$$

(iv) $9/-16 + -5/-12$

It can be written as

$$= 9/-16 + 5/12$$

2	16,12
2	8,6
2	4,3
2	2,3
3	1,3
	1,1

Here LCM of 16 and 12 is 48

So we get

$$= (9 \times 3) / (-16 \times 3) + (5 \times 4) / (12 \times 4)$$

By further calculation

$$= (-27 + 20) / 48$$

$$= -7/48$$

(v) $-5/9 + -7/12 + 11/18$

2	9,12,18
2	9,6,9
3	9,3,9
3	3,1,3
	1,1,1

Here LCM of 9, 12 and 18 is 36

So we get

$$= (-5 \times 4) / (9 \times 4) - (7 \times 3) / (12 \times 3) + (11 \times 2) / (18 \times 2)$$

By further calculation

$$= (-20 - 21 + 22) / 36$$

So we get

$$= (-41 + 22) / 36$$

$$= -19/36$$

(vi) $7/-26 + 16/39$

$$\begin{array}{r|l} 2 & 26,39 \\ 3 & 13,39 \\ 13 & 13,13 \\ \hline & 1,1 \end{array}$$

Here LCM of 26 and 39 is 78

So we get

$$= (-7 \times 3) / (26 \times 3) + (16 \times 2) / (39 \times 2)$$

By further calculation

$$= (-21 + 32) / 78$$

$$= 11/78$$

(vii) $-2/3 - (-5/7)$

It can be written as

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

$$\begin{array}{r|l} 3 & 3,7 \\ 7 & 1,7 \\ \hline & 1,1 \end{array}$$

Here LCM of 3 and 7 is 21

So we get

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

By further calculation

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

$$= 1/21$$

(viii) $-5/7 - (-3/8)$

It can be written as

$$= -5/7 + 3/8$$

$$\begin{array}{r|l} 2 & 7,8 \\ 2 & 7,4 \\ 2 & 7,2 \\ 7 & 7,1 \\ \hline & 1,1 \end{array}$$

Here LCM of 7 and 8 is 56

So we get

$$= (-5 \times 8) / (7 \times 8) + (3 \times 7) / (8 \times 7)$$

By further calculation

$$= (-40 + 21) / 56$$

$$= -19/56$$

(ix) $7/26 + 2 + -11/13$

It can be written as

$$= 7/26 + 2/1 + -11/13$$

$$\begin{array}{r|l} 2 & 26,13 \\ 13 & 13,13 \\ \hline & 1,1 \end{array}$$

Here LCM of 26 and 13 is 26

So we get

$$= (7 \times 1)/(26 \times 1) + (2 \times 26)/(1 \times 26) - (11 \times 2)/(13 \times 2)$$

By further calculation

$$= (7 + 52 - 22)/26$$

So we get

$$= (59 - 22)/26$$

$$= 37/26$$

$$= 1 \frac{11}{26}$$

$$(x) -1 + 2/-3 + 5/6$$

$$\begin{array}{r|l} 2 & 3,6 \\ 3 & 3,3 \\ \hline & 1,1 \end{array}$$

Here LCM of 3 and 6 is 6

So we get

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

By further calculation

$$= (-6 - 4 + 5)/6$$

We get

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

$$= -5/6$$

2. The sum of two rational numbers is $-3/8$. If one of them is $3/16$, find the other.

Solution:

It is given that

$$\text{Sum of two rational numbers} = -3/8$$

$$\text{One rational number} = 3/16$$

$$\text{Other rational number} = -3/8 - 3/16$$

$$\begin{array}{r|l} 2 & 8,16 \\ 2 & 4,8 \\ 2 & 2,4 \\ 2 & 1,2 \\ \hline & 1,1 \end{array}$$

Here LCM of 8 and 16 is 16

So we get

$$= (-3 \times 2)/(8 \times 2) - (3 \times 1)/(16 \times 1)$$

By further calculation
 $= (-6 - 3)/16$
 $= -9/16$

3. The sum of two rational numbers is -5. If one of them is $-52/25$, find the other.

Solution:

It is given that
Sum of two rational numbers = -5
One rational number = $-52/25$
Other rational number = $-5 - (-52/25)$
Here LCM is 25
 $= (-5 \times 25)/(1 \times 25) + (52 \times 1)/(25 \times 1)$
y further calculation
 $= (-125 + 52)/25$
 $= -73/25$

4. What rational number should be added to $-3/16$ to get $11/24$?

Solution:

It is given that
Sum of two rational numbers = $11/24$
One rational number = $-3/16$
Other number = $11/24 - (-3/16)$
It can be written as
 $= 11/24 + 3/16$

2	24,16
2	12,8
2	6,4
2	3,2
3	3,1
	1,1

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Here LCM of 16 and 24 is 48
 $= (11 \times 2)/(24 \times 2) + (3 \times 3)/(16 \times 3)$
By further calculation
 $= (22 + 9)/48$
 $= 31/48$

5. What rational number should be added to $-3/5$ to get 2?

Solution:

So the required rational number = $2 - (-3/5)$
It can be written as
 $= 2 + 3/5$
LCM of 1 and 5 is 5
 $= (2 \times 5)/(1 \times 5) + (3 \times 1)/(5 \times 1)$
By further calculation

$$= (10 + 3) / 5$$

So we get

$$= 13/5$$

$$= 2 \frac{3}{5}$$

6. What rational number should be subtracted from $-5/12$ to get $5/24$?

Solution:

Required rational number = $-5/12 - 5/24$

2	12, 24
2	6, 12
2	3, 6
3	3, 3
	1, 1

Here the LCM of 12 and 24 is 72

$$= (-5 \times 6) / (12 \times 6) - (5 \times 3) / (24 \times 3)$$

By further calculation

$$= (-30 - 15) / 72$$

So we get

$$= -45/72$$

$$= -5/8$$

7. What rational number should be subtracted from $5/8$ to get $8/5$?

Solution:

Required rational number = $5/8 - 8/5$

2	8, 5
2	4, 5
2	2, 5
5	1, 5
	1, 1

Here LCM of 8 and 5 is 40

$$= (5 \times 5) / (8 \times 5) - (8 \times 8) / (5 \times 8)$$

By further calculation

$$= (25 - 64) / 40$$

$$= -39/40$$

8. Evaluate:

(i) $(7/8 \times 24/21) + (-5/9 \times 6/-25)$

(ii) $(8/15 \times -25/16) + (-18/35 \times 5/6)$

(iii) $(18/33 \times -22/27) - (13/25 \times -75/26)$

(iv) $(-13/7 \times -35/39) - (-7/45 \times 9/14)$

Solution:

$$(i) (7/8 \times 24/21) + (-5/9 \times 6/-25)$$

It can be written as

$$= (7 \times 24)/(8 \times 21) + (-5 \times 6)/(9 \times -25)$$

By further simplification

$$= (1 \times 3)/(1 \times 3) + (1 \times 2)/(3 \times 5)$$

So we get

$$= 3/3 + 2/15$$

3	3,15
5	1,5
	1,1

Here LCM of 3 and 15 is 15

$$= (3 \times 5)/(3 \times 5) + (2 \times 1)/(15 \times 1)$$

By further calculation

$$= (15 + 2)/15$$

$$= 17/15$$

$$= 1 \frac{2}{15}$$

$$(ii) (8/15 \times -25/16) + (-18/35 \times 5/6)$$

It can be written as

$$= (8 \times -25)/(15 \times 16) + (-18 \times 5)/(35 \times 6)$$

By further calculation

$$= (1 \times -5)/(3 \times 2) + (-3 \times 1)/(7 \times 1)$$

So we get

$$= -5/6 - 3/7$$

2	6,7
3	3,7
7	1,7
	1,1

Here LCM of 6 and 7 is 42

$$= (-5 \times 7)/(6 \times 7) - (3 \times 6)/(7 \times 6)$$

By further calculation

$$= (-35 - 18)/42$$

$$= -53/42$$

$$(iii) (18/33 \times -22/27) - (13/25 \times -75/26)$$

It can be written as

$$= (18 \times -22)/(33 \times 27) - (13 \times -75)/(25 \times 26)$$

By further calculation

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

So we get

$$= -4/9 - (-3/2)$$

$$= -4/9 + 3/2$$

$$\begin{array}{r|l} 2 & 9,2 \\ \hline 3 & 9,1 \\ \hline 3 & 3,1 \\ \hline & 1,1 \end{array}$$

Here LCM of 9 and 2 is 18

$$= (-4 \times 2) / (9 \times 2) + (3 \times 9) / (2 \times 9)$$

By further calculation

$$= (-8 + 27) / 18$$

$$= 19/18$$

$$= 1 \frac{1}{18}$$

$$(iv) (-13/7 \times -35/39) - (-7/45 \times 9/14)$$

It can be written as

$$= (-13 \times -35) / (7 \times 39) + (7 \times 9) / (45 \times 14)$$

By further calculation

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

So we get

$$= 5/3 + 1/10$$

$$\begin{array}{r|l} 2 & 3,10 \\ \hline 3 & 3,5 \\ \hline 5 & 1,5 \\ \hline & 1,1 \end{array}$$

Here the LCM of 3 and 10 is 30

$$= (5 \times 10) / (3 \times 10) + (1 \times 3) / (10 \times 3)$$

By further calculation

$$= (50 + 3) / 30$$

$$= 53/30$$

$$= 1 \frac{23}{30}$$

9. The product of two rational numbers is 24. If one of them is $-36/11$, find the other.

Solution:

It is given that

$$\text{Product of two rational numbers} = 24$$

$$\text{One rational number} = -36/11$$

$$\text{Other rational number} = 24 \div (-36/11)$$

It can be written as

$$= 24 \times (-11/36)$$

By further calculation

$$= 2 \times (-11/3)$$

$$= -22/3$$

10. By what rational number should we multiply $20/-9$, so that the product may be $-5/9$?

Solution:

$$\text{Here the required rational number} = -5/9 \div (20/-9)$$

By further calculation
 $= -5/9 \times (-9/20)$
 $= 1/4$



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