EXERCISE 2A PAGE: 19

1. Write down a rational number whose numerator is the largest number of two digits and denominator is the smallest number of four digits.
Solution:

We know that the largest two digit number is 99
So the smallest four digit number is 1000
Numerator = 99
Denominator = 1000
Rational number = 99/1000

2. Write the numerator of each of the following rational numbers:
(i) – 125/127
(ii) 37/ -137
(iii) – 85/ 93
(iv) 2
(v) 0
Solution:

(i) – 125/127
Here the numerator = - 125

(ii) 37/ -137
Here the numerator = 37

(iii) – 85/ 93
Here the numerator = - 85

(iv) 2 = 2/1
Here the numerator = 2

(v) 0 = 0/1
Here the numerator = 0

3. Write the denominator of each of the following rational numbers:
(i) 7/ -15
(ii) – 18/29
(iii) – 3/4
(iv) – 7
(v) 0
Solution:

(i) 7/ -15
Here the denominator = - 15

(ii) – 18/29
Here the denominator = 29

(iii) – 3/4

Here the denominator = 4

(iv) – 7 = -7/1
Here the denominator = 1

(v) 0 = 0/1
Here the denominator = 1

4. Write down a rational number with numerator (-5) × (-4) and with denominator (28 – 27) × (8 – 5).
Solution:

It is given that
Numerator = (-5) × (-4) = 20
Denominator = (28 – 27) × (8 – 5) = 1 × 3 = 3
So the rational number = 20/3

5. (i) – 15/1 in integer form is …….
(ii) 23/-1 in integer form is ……..
(iii) If 18 = 18/a then a = …….
(iv) If – 57 = 57/a then a = ……
Solution:

(i) – 15/1 in integer form is – 15.

(ii) 23/-1 in integer form is – 23.

(iii) If 18 = 18/a then a = 18/18 = 1.

(iv) If – 57 = 57/a then a = 57/-57 = - 1.

6. Separate positive and negative rational numbers from the following:
-3/ 5, 3/-5, -3/-5, 3/5, 0, -13/-3, 15/-8, -15/8
Solution:

Here the positive rational numbers are
-3/-5 = 3/5 as both are negative
-13/-3 = 13/3 as both are negative and 3/5

Similarly the negative rational numbers are
-3/5, 3/ -5, 15/-8 and -15/8

0 is neither positive nor negative integer.

7. Find three rational numbers equivalent to
(i) 3/5
(ii) 4/-7
(iii) -5/9
(iv) 8/-15
Solution:

(i) 3/5
It can be written as
3/5 = (3 × 2)/ (5 × 2) = 6/10
3/5 = (3 × 3)/ (5 × 3) = 9/15
3/5 = (3 × 4)/ (5 × 4) = 12/20

Therefore, 6/10, 9/15 and 12/20 are the rational numbers which are equivalent to the given rational number 3/5.

(ii) 4/-7
It can be written as
4/-7 = (4 × 2)/ (-7 × 2) = 8/ -14
4/-7 = (4 × 3)/ (-7 × 3) = 12/-21
4/-7 = (4 × 4)/ (-7 × 4) = 16/ -28

Therefore, 8/-14, 12/-21 and 16/-28 are the rational numbers which are equivalent to the given rational number 4/-7.

(iii) -5/9
It can be written as
-5/9 = (-5 × 2)/ (9 × 2) = -10/18
-5/9 = (-5 × 3)/ (9 × 3) = - 15/27
-5/9 = (-5 × 4)/ (9 × 4) = -20/36

Therefore, -10/18, -15/27 and -20/36 are the rational numbers which are equivalent to the given rational number -5/9.

(iv) 8/-15
It can be written as
8/-15 = (8 × 2)/ (-15 × 2) = 16/-30
8/-15 = (8 × 3)/ (-15 × 3) = 24/ -45
8/-15 = (8 × 4)/ (-15 × 4) = 32/-60

Therefore, 16/-30, 24/-45 and 32/-60 are the rational numbers which are equivalent to the given rational number 8/-15.

8. Which of the following are not rational numbers:
(i) – 3
(ii) 0
(iii) 0/4
(iv) 8/0
(v) 0/0
Solution:

(i) – 3 = -3/1 is a rational number.

(ii) 0 = 0/1 is a rational number.

(iii) 0/4 is a rational number.

(iv) 8/0 is not a rational number.

(v) 0/0 is not a rational number as both numerator and denominator are zero.

9. Express each of the following integers as a rational number with denominator 7:
(i) 5
(ii) – 8
(iii) 0
(iv) – 16
(v) 7
Solution:

(i) 5
By multiplying and dividing by 7
= (5 × 7)/ 7
= 35/7

(ii) – 8
By multiplying and dividing by 7
= (-8 × 7)/ 7
= - 56/7

(iii) 0
By multiplying and dividing by 7
= (0 × 7)/ 7
= 0/7

(iv) – 16
By multiplying and dividing by 7
= (-16 × 7)/ 7
= - 112/7

(v) 7
By multiplying and dividing by 7
= (7 × 7)/ 7
= 49/7

10. Express 3/5 as a rational number with denominator:
(i) 20
(ii) – 20
(iii) 45
(iv) 25
(v) – 35
Solution:

(i) 20
It can be written as
3/5 = (3 × 4)/ (5 × 4) = 12/20

(ii) – 20
It can be written as
3/5 = (3 × -4)/ (5 × -4) = -12/-20

(iii) 45
It can be written as
3/5 = (3 × 9)/ (5 × 9) = 27/45

(iv) 25
It can be written as
3/5 = (3 × 5)/ (5 × 5) = 15/25

(v) – 35
It can be written as
3/5 = (3 × -7)/ (5 × -7) = -21/-35

11. Express 4/7 as a rational number with numerator:
(i) 12
(ii) – 12
(iii) – 16
(iv) – 20
(v) 20
Solution:

(i) 12
It can be written as
4/7 = (4 × 3)/ (7 × 3) = 12/21

(ii) – 12
It can be written as
4/7 = (4 × -3)/ (7 × -3) = -12/-21

(iii) – 16
It can be written as
4/7 = (4 × -4)/ (7 × -4) = - 16/-28

(iv) – 20
It can be written as
4/7 = (4 × -5)/ (7 × -5) = -20/-35

(v) 20
It can be written as
4/7 = (4 × 5)/ (7 × 5) = 20/35

12. Find x, such that:
(i) – 2/3 = 6/ x
(ii) 7/-4 = x/8
(iii) 3/7 = x/-35
(iv) -48/x = 6
(v) 36/x = 3
(vi) – 27/x = 9
Solution:

(i) – 2/3 = 6/ x

By cross multiplication
-2x = 6 × 3
By further calculation
x = (6 × 3)/ -2
So we get
x = 18/-2 = -9

Hence, - 2/3 = 6/-9.

(ii) 7/-4 = x/8
By cross multiplication
7 × 8 = - 4 × x
On further calculation
56 = -4x
So we get
x = 56/-4 = -14

Hence, 7/-4 = -14/8.

(iii) 3/7 = x/-35
By cross multiplication
7x = - 35 × 3
On further calculation
x = (-35 × 3)/ 7
So we get
x = -15

Hence, 3/7 = -15/-35.

(iv) -48/x = 6
By cross multiplication
6x = -48
On further calculation
x = -48/6 = - 8

Hence, -48/-8 = 6.

(v) 36/x = 3
By cross multiplication
3x = 36
On further calculation
x = 12

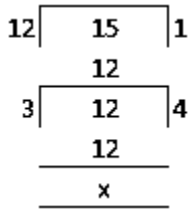
Hence, 36/12 = 3.

(vi) – 27/x = 9
By cross multiplication
9x = -27
On further calculation
x = -27/9 = - 3

Hence, -27/-3 = 9.

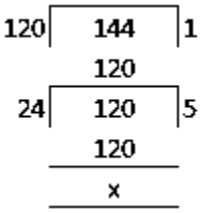
13. Express each of the following rational numbers to the lowest terms:
(i) 12/15
(ii) – 120/144
(iii) – 48/ - 72
(iv) 14/-56
Solution:

(i) 12/15



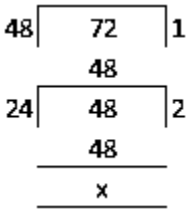
Here dividing by 3 which is the HCF of 12 and 15
(12 ÷ 3)/ (15 ÷ 3) = 4/5

(ii) – 120/144



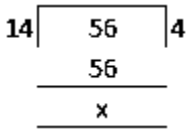
Here dividing by 25 which is the HCF of -120 and 144
(-120 ÷ 24)/ (144 ÷ 24) = - 5/6

(iii) – 48/ - 72



Here dividing by 24 which is the HCF of -48 and – 72
(-48 ÷ 24)/ (-72 ÷ 24) = -2/-3 = 2/3

(iv) 14/-56



Here dividing by 14 which is the HCF of 14 and - 56
(14 ÷ 14)/ (-56 ÷ 14) = 1/-4 or – 1/4

14. Express each of the following rational numbers in the standard form.

(i) -7/-8
(ii) 5/ - 12
(iii) – 7/ - 20
(iv) 4/ -9
Solution:

Here a rational number is in standard form if its denominator is positive in lowest term.

(i) -7/-8 = 7/8

(ii) 5/ - 12 = -5/12

(iii) – 7/ - 20 = 7/20

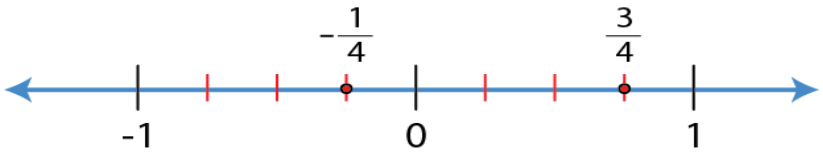
(iv) 4/ -9 = -4/9

EXERCISE 2B

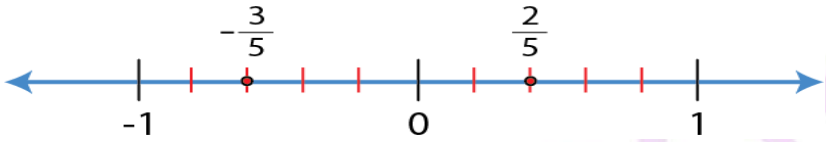
PAGE: 25

1. Mark the following pairs of rational numbers on the separate number lines:
(i) 3/4 and -1/4
(ii) 2/5 and -3/5
(iii) 5/6 and -2/3
(iv) 2/5 and -4/5
(v) 1/4 and -5/4
Solution:

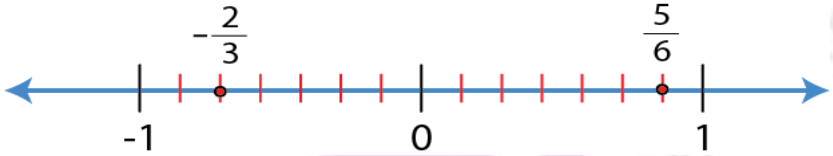
(i) 3/4 and -1/4



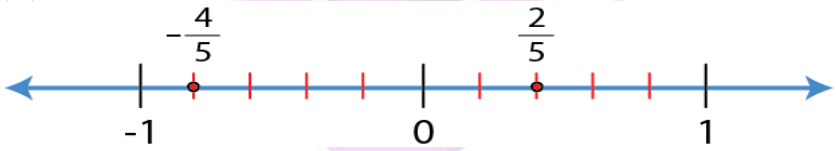
(ii) 2/5 and -3/5



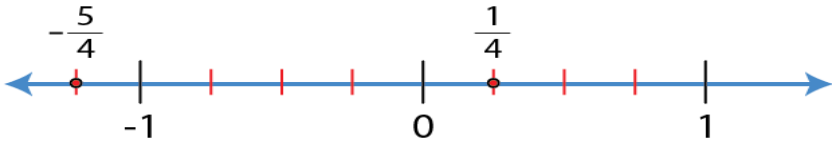
(iii) 5/6 and -2/3



(iv) 2/5 and -4/5

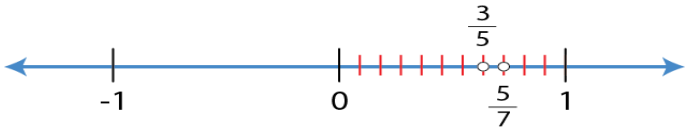


(v) 1/4 and -5/4



2. Compare:
(i) 3/5 and 5/7
(ii) -7/2 and 5/2
(iii) -3 and 2 ¾
(iv) – 1 ½ and 0
(v) 0 and 3/4
(vi) 3 and -1
Solution:

(i) 3/5 and 5/7



5/7 is on the right side of the number line.
Hence, 3/5 < 5/7.

(ii) -7/2 and 5/2

P is on the right of Q
Hence, -7/2 < 5/2.

(iii) -3 and 2 ¾

P is on the right of Q
Hence, -3 < 11/4 or – 3 < 2 ¾.

(iv) – 1 ½ and 0

P is on the right of Q
Hence, -3/2 < 0 or – 1 ½ < 0.

(v) 0 and ¾

P is on the right of Q
Hence, 0 < 3/4.

(vi) 3 and -1

P is on the right of Q
Hence, 3 > - 1.

3. Compare:
(i) -1/4 and 0

(ii) 1/4 and 0
(iii) -3/8 and 2/5
(iv) -5/8 and 7/-12
(v) 5/-9 and -5/-9
(vi) -7/8 and 5/-6
(vii) 2/7 and -3/-8
Solution:

(i) -1/4 and 0
-1/4 is a negative rational number which is always less than 0.
Hence, -1/4 < 0.

(ii) 1/4 and 0
1/4 is a positive rational number which is always greater than 0.
Hence, 1/4 > 0.

(iii) -3/8 and 2/5
We know that
a/b and c/d = a × d and b × c
So we get
a × d < b × c
Substituting the values
- 3 × 5 and 2 × 8
- 15 < 16
Hence, -3/8 < 2/5.

(iv) -5/8 and 7/-12
It can be written as
-5/ 8 and -7/12
We know that
a/b and c/d = a × d and b × c
So we get
a × d < b × c
Substituting the values
- 5 × 12 and - 7 × 8
-60 < - 56
Hence, -5/8 < 7/-12.

(v) 5/-9 and -5/-9
We know that
a/b and c/d = a × d and b × c
So we get
a × d < b × c
Substituting the values
5 × -9 and -5 × -9
- 45 < 45
Hence, 5/-9 < -5/-9.

(vi) -7/8 and 5/-6
It can be written as

-7/ 8 and -5/6
We know that
a/b and c/d = a × d and b × c
So we get
a × d < b × c
Substituting the values
- 7 × 6 and -5 × 8
-42 < -40
Hence, -7/8 < 5/-6.

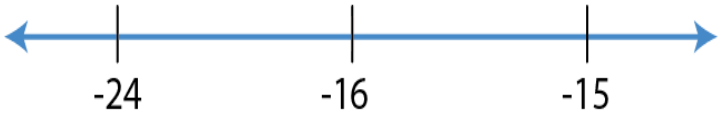
(vii) 2/7 and -3/-8
It can be written as
2/7 and 3/8
We know that
a/b and c/d = a × d and b × c
So we get
a × d < b × c
Substituting the values
2 × 8 and 7 × 3
16 < 21
Hence, 2/7 < - 3/ -8.

4. Arrange the given rational numbers in ascending order:
(i) 7/10, -11/-30 and 5/-15
(ii) 4/-9, -5/12 and 2/-3
Solution:

(i) 7/10, -11/-30 and 5/-15
It is given that
= 7/10, -11/-30 and -5/-5
LCM of 10, 30 and 15 = 30
= (7 × 3)/ (10 × 3), 11/30 and (-5 × 2)/ (15 × 2)
So we get
= 21/30, 11/30 and -10/30

Here, -10 < 11 < 21
We can write it as
-10/ 30 < 11/30 < 21/30
By further calculation
5/ -15 < -11/ -30 < 7/10

(ii) 4/-9, -5/12 and 2/-3
It is given that
= -4/9, -5/12 and -2/3
LCM of 9, 12 and 3 is 36
= (-4 × 4)/ (9 × 4), (-5 × 3)/ (12 × 3) and (-2 × 12)/ (3 × 12)
So we get
= -16/36, -15/36 and -24/36



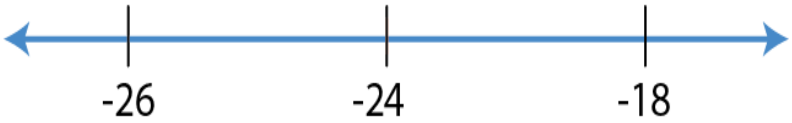
Here, -24 < -16 < -15
We can write it as
-24/36 < -16/36 < -15/36
By further calculation
2/ -3 < 4/ -9 < -5/12

5. Arrange the given rational numbers in descending order:
(i) 5/8, 13/-16 and -7/12
(ii) 3/-10, -13/30 and 8/-20
Solution:

(i) 5/8, 13/-16 and -7/12
It can be written as
= 5/8, -13/16 and -7/12
LCM of 8, 16 and 12 is 48
= (5 × 6)/ (8 × 6), (-13 × 3)/ (16 × 3) and (-7 × 4)/ (12 × 4)
So we get
= 30/48, -39/48 and -28/48

Here, 30 > - 28 > - 39
We can write it as
30/48 > -28/48 > -39/48
By further calculation
5/8 > -7/12 > 13/-16

(ii) 3/-10, -13/30 and 8/-20
It can be written as
= -3/10, -13/30 and -8/20
LCM of 10, 20 and 30 is 60
= (- 3 × 6)/ (10 × 6), (-13 × 2)/ (30 × 2) and (-8 × 3)/ (20 × 3)
So we get
= -18/60, -26/60 and -24/60



Here, -18 > -24 > -26
We can write it as
-18/60 > -24/60 > -26/60
By further calculation
3/ -10 > 8/-20 > -13/30

6. Fill in the blanks:
(i) 5/8 and 3/10 are on the ……. side of zero.

(ii) -5/8 and 3/10 are on the …….. sides of zero.
(iii) -5/8 and -3/10 are on the ……. side of zero.
(iv) 5/8 and -3/10 are on the …….. sides of zero.
Solution:

(i) 5/8 and 3/10 are on the same side of zero.

(ii) -5/8 and 3/10 are on the opposite sides of zero.

(iii) -5/8 and -3/10 are on the same side of zero.

(iv) 5/8 and -3/10 are on the opposite sides of zero.

EXERCISE 2C

1. Add:
(i) 7/5 and 2/5
(ii) -4/9 and 2/9
(iii) 5/-12 and 1/12
(iv) 4/-15 and -7/-15
(v) -7/25 and 9/-25
(vi) -7/26 and 7/-26
Solution:

(i) 7/5 and 2/5
It can be written as
= 7/5 + 2/5
By further calculation
= (7 + 2)/ 5
= 9/5
= 1 4/5

(ii) -4/9 and 2/9
It can be written as
= -4/9 + 2/9
By further calculation
= (-4 + 2)/ 9
= -2/9

(iii) 5/-12 and 1/12
It can be written as
= -5/12 + 1/12
By further calculation
= (-5 + 1)/ 12
= -4/ 12
= -1/3

(iv) 4/-15 and -7/-15
It can be written as
= - 4/15 + 7/15
By further calculation
= (-4 + 7)/ 15
= 3/15
= 1/5

(v) -7/25 and 9/-25
It can be written as
= -7/25 + -9/25
By further calculation
= [(-7) + (-9)]/ 25
= -16/25

(vi) -7/26 and 7/-26

It can be written as
= - 7/26 + -7/26
By further calculation
= [(-7) + (-7)]/ 26
= - 14/26
= -7/13

2. Add:
(i) -2/5 and 3/7
(ii) -5/6 and 4/9
(iii) – 3 and 2/3
(iv) -5/9 and 7/18
(v) -7/24 and -5/48
(vi) 1/-18 and 5/-27
(vii) -9/25 and 1/-75
(viii) 13/-16 and -11/24
(ix) -9/-16 and -11/8
Solution:

(i) -2/5 and 3/7
It can be written as
= (-2 × 7)/ (5 × 7) + (3 × 5)/ (7 × 5)
LCM of 5 and 7 is 35
= -14/35 + 15/35
By further calculation
= (-14 + 15)/35
= 1/35

(ii) -5/6 and 4/9
It can be written as
= -5/6 + 4/9
LCM of 6 and 9 is 36
= (-5 × 6)/ (6 × 6) + (4 × 4)/ (9 × 4)
By further calculation
= -30/36 + 16/36
So we get
= (-30 + 16)/ 36
= -14/36
= - 7/18

(iii) – 3 and 2/3
It can be written as
= -3/1 + 2/3
LCM of 1 and 3 is 3
= (- 3 × 3)/ (1 × 3) + (2 × 1)/ (3 × 1)
By further calculation
= -9/3 + 2/3
So we get
= (-9 + 2)/ 3
= -7/3

(iv) -5/9 and 7/18
It can be written as
= -5/9 + 7/18
LCM of 9 and 18 is 18
= (-5 × 2)/ (9 × 2) + (7 × 1)/ (18 × 1)
By further calculation
= -10/18 + 7/18
So we get
= (-10 + 7)/ 18
= - 3/18
= -1/6

(v) -7/24 and -5/48
It can be written as
= -7/24 + -5/48
LCM of 24 and 48 is 48
= (-7 × 2)/ (24 × 2) + (-5 × 1)/ (48 × 1)
By further calculation
= -14/48 + -5/48
So we get
= (-14 – 5)/ 48
= - 19/48

(vi) 1/-18 and 5/-27
It can be written as
= - 1/18 + -5/27
LCM of 18 and 27 is 54
= (-1 × 3)/ (18 × 3) + (-5 × 2)/ (27 × 2)
By further calculation
= -3/54 + -10/54
So we get
= (- 3 – 10)/ 54
= -13/54

(vii) -9/25 and 1/-75
It can be written as
= -9/25 + -1/75
LCM of 24 and 75 is 75
= (-9 × 3)/ (25 × 3) + (-1 × 1)/ (75 × 1)
By further calculation
= -27/75 + -1/75
So we get
= (-27 – 1)/ 75
= -28/75

(viii) 13/-16 and -11/24
It can be written as
= -13/16 + -11/24
LCM of 16 and 24 is 48
= (-13 × 3)/ (16 × 3) + (-11 × 2)/ (24 × 2)

By further calculation
= -39/48 + -22/48
So we get
= (-39 – 22)/ 48
= -61/48

(ix) -9/-16 and -11/8
It can be written as
= 9/16 + -11/8
LCM of 16 and 8 is 16
= (9 × 1)/ (16 × 1) + (-11 × 2)/ (8 × 2)
By further calculation
= 9/16 + -22/16
So we get
= (9 – 22)/ 16
= -13/16

3. Evaluate:
(i) -2/5 + 3/5 + -1/5
(ii) -8/9 + 4/9 + -2/9
(iii) 5/-24 + -1/8 + 3/16
(iv) -7/6 + 4/-15 + -4/-30
(v) -2 + 2/5 + -2/15
(vi) -11/12 + 5/16 + -3/8
Solution:

(i) -2/5 + 3/5 + -1/5
It can be written as
= (-2 + 3 – 1)/ 5
By further calculation
= 0/5
= 0

(ii) -8/9 + 4/9 + -2/9
It can be written as
= (-8 + 4 – 2)/ 9
By further calculation
= (-10 + 4)/ 9
= -6/9
= -2/3

(iii) 5/-24 + -1/8 + 3/16
It can be written as
= -5/24 + -1/8 + 3/16
LCM of 8, 16 and 24 is 48
= (-5 × 2)/ (24 × 2) + (-1 × 6)/ (8 × 6) + (3 × 3)/ (16 × 3)
By further calculation
= -10/ 48 + -6/48 + 9/48
So we get
= (-10 – 6 + 9)/ 48

= (-16 + 9)/ 48
= -7/48

(iv) -7/6 + 4/-15 + -4/-30
It can be written as
= -7/6 + -4/15 + 4/30
LCM of 6, 15 and 30 is 30
= (-7 × 5)/ (6 × 5) + (-4 × 2)/ (15 × 2) + (4 × 1)/ (30 × 1)
By further calculation
= -35/30 + -8/30 + 4/30
So we get
= (-35 – 8 + 4)/ 30
= (-43 + 4)/ 30
= - 39/30
= -13/10

(v) -2 + 2/5 + -2/15
It can be written as
= -2/1 + 2/5 + -2/15
LCM of 1, 5 and 15 is 15
= (-2 × 15)/ (1 × 15) + (2 × 3)/ (5 × 3) + (-2 × 1)/ (15 × 1)
By further calculation
= -30/15 + 6/15 + -2/15
So we get
= (-30 + 6 – 2)/ 15
= (-32 + 6)/ 15
= -26/15

(vi) -11/12 + 5/16 + -3/8
It can be written as
= -11/12 + 5/16 + -3/8
LCM of 12, 16 and 8 is 48
= (-11 × 4)/ (12 × 4) + (5 × 3)/ (16 × 3) + (-3 × 6)/ (8 × 6)
By further calculation
= -44/48 + 15/48 + -18/48
So we get
= (-44 + 15 – 18)/ 48
= (-62 + 15)/ 48
= -47/ 48

4. Evaluate:
(i) -11/18 + -3/9 + 2/-3
(ii) -9/4 + 13/3 +25/6
(iii) – 5 + 5/-8 + -5/-12
(iv) -2/3 + 5/2 + 2
(v) 5 + -3/4 + -5/8
Solution:

(i) -11/18 + -3/9 + 2/-3
It can be written as

= - 11/18 + -3/9 + -2/3
LCM of 3, 9 and 18 is 18
= (-11 × 1)/ (18 × 1) + (-3 × 2)/ (9 × 2) + (-2 × 6)/ (3 × 6)
By further calculation
= -11/18 + -6/18 + -12/18
So we get
= (-11 – 6 – 12)/18
= -29/18

(ii) -9/4 + 13/3 +25/6
It can be written as
= -9/4 + 13/3 + 25/6
LCM of 4, 3 and 6 is 24
= (-9 × 6)/ (4 × 6) + (13 × 8)/ (3 × 8) + (25 × 4)/ (6 × 4)
By further calculation
= -54/24 + 104/24 + 100/24
So we get
= (-54 + 104 + 100)/ 24
= 150/24
= 25/4
= 6 1/4

(iii) – 5 + 5/-8 + -5/-12
It can be written as
= -5/1 + -5/8 + 5/12
LCM of 1, 8 and 12 is 24
= (-5 × 24)/ (1 × 24) + (-5 × 3)/ (8 × 3) + (5 × 2)/ (12 × 2)
By further calculation
= -120/24 + -15/24 + 10/24
So we get
= (-120 – 15 + 10)/24
= -125/24

(iv) -2/3 + 5/2 + 2
It can be written as
= -2/3 + 5/2 + 2/1
LCM of 3, 2 and 1 is 6
= (-2 × 2)/ (3 × 2) + (5 × 3)/ (2 × 3) + (2 × 6)/ (1 × 6)
By further calculation
= -4/6 + 15/6 + 12/6
So we get
= (-4 + 15 + 12)/ 6
= 23/6
= 3 5/6

(v) 5 + -3/4 + -5/8
It can be written as
= 5/1 + -3/4 + -5/8
LCM of 1, 4 and 8 is 8
= (5 × 8)/ (1 × 8) + (-3 × 2)/ (4 × 2) + (-5 × 1)/ (8 × 1)

By further calculation
= 40/8 + -6/8 + -5/8
So we get
= (40 – 6 – 5)/ 8
= (40 – 11)/8
= 29/8
= 3 5/8

5. Subtract:
(i) 2/9 from 5/9
(ii) -6/11 from -3/-11
(iii) -2/15 from -8/15
(iv) 11/18 from -5/18
(v) -4/11 from -2
Solution:

(i) 2/9 from 5/9
It can be written as
= 5/9 – 2/9
By further calculation
= (5 – 2)/ 9
= 3/9
= 1/3

(ii) -6/11 from -3/-11
It can be written as
= 3/ 11 – (-6/11)
By further calculation
= 3/11 + 6/11
So we get
= (3 + 6)/ 11
= 9/11

(iii) -2/15 from -8/15
It can be written as
= -8/15 – (-2/15)
By further calculation
= -8/15 + 2/15
So we get
= (-8 + 2)/ 15
= -6/ 15
= -2/5

(iv) 11/18 from -5/18
It can be written as
= -5/18 – 11/18
By further calculation
= (-5 – 11)/ 18
So we get
= -16/18

= -8/9

(v) -4/11 from -2
It can be written as
= -2/1 – (-4/11)
LCM of 1 and 11 is 11
= (- 2 × 11)/ (1 × 11) + (4 × 1)/ (11 × 1)
By further calculation
= -22/11 + 4/11
So we get
= (-22 + 4)/ 11
= -18/11

6. Subtract:
(i) -3/10 from 1/5
(ii) -6/25 from -8/5
(iii) -7/4 from -2
(iv) -16/21 from 1
(v) -8/15 from 0
(vi) 0 from -3/8
(vii) -2 from -3/10
(viii) 5/8 from -5/16
(ix) 4 from -3/13
Solution:

(i) -3/10 from 1/5
It can be written as
= 1/5 – (-3/10)
LCM of 5 and 10 is 10
= (1 × 2)/ (5 × 2) + 3/10
By further calculation
= 2/10 + 3/10
So we get
= (2 + 3)/ 10
= 5/10
= 1/2

(ii) -6/25 from -8/5
It can be written as
= -8/5 – (-6/25)
LCM of 5 and 25 is 25
= (-8 × 5)/ (5 × 5) + 6/25
By further calculation
= -40/25 + 6/25
So we get
= (-40 + 6)/ 25
= -34/25

(iii) -7/4 from -2
It can be written as

= (-2/1) – (-7/4)
LCM of 1 and 4 is 4
= (-2 × 4)/ (1 × 4) + 7/4
= -8/4 + 7/4
By further calculation
= (-8 + 7)/ 4
= -1/4

(iv) -16/21 from 1
It can be written as
= 1/1 – (-16/21)
= 1/1 + 16/21
By further calculation
= (21 + 16)/ 21
So we get
= (21 + 16)/21
= 37/21
= 1 16/21

(v) -8/15 from 0
It can be written as
= 0 – (-8/15)
By further calculation
= 0 + 8/15
= 8/15

(vi) 0 from -3/8
It can be written as
= -3/8 – 0
= -3/8

(vii) -2 from -3/10
It can be written as
= -3/10 – (-2/1)
By further calculation
= -3/10 + 2/1
So we get
= (-3 + 2 × 10)/10
= 17/10
= 1 7/10

(viii) 5/8 from -5/16
It can be written as
= -5/16 – 5/8
LCM of 8 and 16 is 16
= -5/16 – (5 × 2)/ (8 × 2)
By further calculation
= -5/16 – 10/16
So we get
= (-5 – 10)/16

= - 15/16

(ix) 4 from -3/13
It can be written as
= 3/13 – 4/1
LCM of 13 and 1 is 13
= (- 3 – 4 × 13)/ 13
By further calculation
= (-3 – 52)/13
= -55/13

7. The sum of two rational numbers is 11/24. If one of them is 3/8, find the other.
Solution:

It is given that
Sum of two rational numbers = 11/24
One of the rational number = 3/8
Other rational number = 11/24 – 3/8
LCM of 24 and 8 is 24
= 11/24 – (3 × 3)/ (8 × 3)
By further calculation
= 11/24 – 9/24
So we get
= (11 – 9)/ 24
= 2/24
= 1/12

8. The sum of two rational numbers is -7/12. If one of them is 13/24, find the other.
Solution:

It is given that
Sum of two rational numbers = -7/12
One of the rational number = 13/24
Other rational number = -7/12 – 13/24
LCM of 12 and 24 is 24
= (-7 × 2)/ (12 × 2) – 13/24
By further calculation
= -14/24 – 13/24
So we get
= (-14 – 13)/ 24
= -27/24
= -9/8

9. The sum of two rational numbers is -4. If one of them is -13/12, find the other.
Solution:

It is given that
Sum of two rational numbers = -4
One of the rational number = -13/12
Other rational number = - 4 – (-13/12)

LCM of 1 and 12 is 12
= - 4 + 13/12
By further calculation
= (-4 × 12 + 13)/ 12
So we get
= (-48 + 13)/ 12
= -35/12

10. What should be added to -3/16 to get 11/24?
Solution:

Consider x as the required rational number
Other number = -3/16
Sum of two numbers = 11/24
From the question
-3/16 + x = 11/24
By further calculation
x = 11/24 + 3/16
LCM of 16 and 24 is 48
x = (11 × 2)/ (24 × 2) + (3 × 3)/ (16 × 3)
So we get
x = 22/48 + 9/48
x = (22 + 9)/ 48 = 31/48

11. What should be added to -3/5 to get 2?
Solution:

Consider x as the required rational number
Other number = -3/5
Here the sum of two numbers is 2
From the question
-3/5 + x = 2
By further calculation
x = 2 + 3/5
LCM of 1 and 5 is 5
x = (2 × 5 + 3)/ 5
So we get
= (10 + 3)/ 5
= 13/5
= 2 3/5

12. What should be subtracted from -4/5 to get 1?
Solution:

Consider x as the required rational number
Other number = -4/5
Here the difference between two numbers is 1
From the question
-4/5 – x = 1
By further calculation

-4/5 – 1 = x
So we get
x = (-4 – 1 × 5)/ 5
x = (-4 – 5)/ 5 = -9/5

13. The sum of two numbers is -6/5. If one of them is -2, find the other.
Solution:

It is given that
Sum of two numbers = -6/5
One of the numbers = -2
Other number = -6/5 – (-2/1)
LCM of 1 and 5 is 5
= - 6/5 – (2 × 5)/ (1 × 5)
By further calculation
= (-6 + 10)/ 5
= 4/5

14. What should be added to -7/12 to get 3/8?
Solution:

Consider x as the required rational number
Other rational number = -7/12
Sum of two numbers = 3/8
Using the question
-7/12 + x = 3/8
So we get
x = 3/8 – (-7/12)
LCM of 8 and 12 is 24
x = (3 × 3)/ (8 × 3) + (7 × 2)/ (12 × 2)
By further calculation
= 9/24 + 14/24
So we get
= (9 + 14)/ 24 = 23/34

15. What should be subtracted from 5/9 to get 9/5?
Solution:

Consider x as the first number
Other number is 5/9
Here the difference between two numbers is 9/5
Using the question
5/9 – x = 9/5
So we get
x = 5/9 – 9/5
LCM of 9 and 5 is 45
x = (5 × 5)/ (9 × 5) – (9 × 9)/ (5 × 9)
By further calculation
x = 25/45 – 81/45
x = (25 - 81)/ 45 = - 56/45

EXERCISE 2D

1. Evaluate:
(i) 5/4 × 3/7
(ii) 2/3 × -6/7
(iii) (-12/5) × (10/-3)
(iv) -45/39 × -13/ 15
(v) 3 1/8 × (-2 2/5)
(vi) 2 14/25 × (-5/16)
(vii) (-8/9) × (-3/ 16)
(viii) (5/-27) × (-9/ 20)
Solution:

(i) 5/4 × 3/7
It can be written as
= (5 × 3)/ (4 × 7)
= 15/28

(ii) 2/3 × -6/7
It can be written as
= (2 × -6)/ (3 × 7)
By further calculation
= (2 × -2)/ 7
= -4/7

(iii) (-12/5) × (10/-3)
It can be written as
= (-12 × 10)/ (5 × -3)
By further calculation
= 4 × 2
= 8

(iv) -45/39 × -13/ 15
It can be written as
= (-45 × -13)/ (39 × 15)
By further calculation
= (-3 × -1)/ (3 × 1)
So we get
= 3/3
= 1

(v) 3 1/8 × (-2 2/5)
It can be written as
= (3 × 8 + 1)/ 8 × (-2 × 5 + 2)/ 5
By further calculation
= 25/8 × (-12/5)
So we get
= (25 × -12)/ (8 × 5)
On further simplification
= (5 × -3)/ (2 × 1)

= -15/2

(vi) 2 14/25 × (-5/16)
It can be written as
= (2 × 25 + 14)/ 25 × (-5/16)
By further calculation
= 64/25 × (-5/16)
= (64 × -5)/ (25 × 16)
On further simplification
= (4 × -1)/ (5 × 1)
= -4/5

(vii) (-8/9) × (-3/ 16)
It can be written as
= (-8 × -3)/ (9 × 16)
By further calculation
= (-1 × -1)/ (3 × 2)
= 1/6

(viii) (5/-27) × (-9/ 20)
It can be written as
= (5 × -9)/ (-27 × 20)
By further calculation
= (1 × 1)/ (3 × 4)
= 1/12

2. Multiply:
(i) 3/25 and 4/5
(ii) 1 1/8 and 10 2/3
(iii) 6 2/3 and -3/8
(iv) -13/15 and -25/26
(v) 1 1/6 and 18
(vi) 2 1/14 and -7
(vii) 5 1/8 and -16
(viii) 35 and -18/25
(ix) 6 2/3 and -3/8
(x) 3 3/5 and -10
(xi) 27/28 and -14
(xii) -24 and 5/16
Solution:

(i) 3/25 and 4/5
It can be written as
= 3/25 × 4/5
By further calculation
= (3 × 4)/ (25 × 5)
= 12/125

(ii) 1 1/8 and 10 2/3
It can be written as

= 9/8 × 32/2
By further calculation
= (9 × 32)/ (8 × 3)
= 3 × 4
= 12

(iii) 6 2/3 and -3/8
It can be written as
= 20/3 × -3/8
By further calculation
= (20 × -3)/ (3 × 8)
So we get
= (5 × -1)/ (1 × 2)
= -5/2

(iv) -13/15 and -25/26
It can be written as
= (-13 × -25)/ (15 × 26)
By further calculation
= (-1 × -5)/ (3 × 2)
= 5/6

(v) 1 1/6 and 18
It can be written as
= 7/6 × 18
By further calculation
= 7 × 3
= 21

(vi) 2 1/14 and -7
It can be written as
= (2 × 14 + 1)/ 14 × (-7)
By further calculation
= 29/4 × (-7)
So we get
= (29 × -1)/ 2
= -29/2

(vii) 5 1/8 and -16
It can be written as
= 41/8 × -16
By further calculation
= 41 × -2
= -82

(viii) 35 and -18/25
It can be written as
= 35 × -18/25
By further calculation
= (35 × -18)/ 25

So we get
= (7 × -18)/ 5
= -126/5

(ix) 6 2/3 and -3/8
It can be written as
= 20/3 × -3/8
By further calculation
= (20 × -3)/ (3 × 8)
So we get
= (5 × -1)/ (1 × 2)
= -5/2

(x) 3 3/5 and -10
It can be written as
= (3 × 5 + 3)/ 5 × -10
By further calculation
= 18/5 × -10
So we get
= 18 × -2
= -36

(xi) 27/28 and -14
It can be written as
= 27/28 × -14
By further calculation
= (27 × -1)/ 2
= -27/2

(xii) -24 and 5/16
It can be written as
= (-24 × 5)/ 16
By further calculation
= (-3 × 5)/ 2
So we get
= -15/2

3. Evaluate:
(i) (6 × 5/18) – (- 4 2/9)
(ii) (7/8 × 8/7) + (-5/9) × (6/-25)
(iii) (11/-9 × 21/44) + (-5/9) × (63/ -100)
(iv) (-5/9 × 6/-25) + (24/21 × 7/8)
(v) (-35/39 × -13/7) – (7/90 × -18/14)
(vi) (-4/5 × 3/2) + (9/-5 × 10/3) – (-3/2 × -1/4)
Solution:

(i) (6 × 5/18) – (- 4 2/9)
It can be written as
= (-1 × 5/3) – [- (4 × 9 + 2)/ 9]
LCM of 3 and 9 is 9

= -5/3 – (-38/9)
So we get
= -5/3 + 38/9
By further calculation
= (-5 × 3)/ (3 × 3) + (38 × 1)/ (9 × 1)
= (-15 + 38)/ 9
= 23/9
= 2 5/9

(ii) (7/8 × 8/7) + (-5/9) × (6/-25)
It can be written as
= (7/8 × 8/7) + (-5/9 × 6/-25)
By further calculation
= 1/1 + (1 × 2)/ (3 × 5)
So we get
= 1/1 + 2/15
= (15 + 2)/ 15
= 17/15
= 1 2/15

(iii) (11/-9 × 21/44) + (-5/9) × (63/ -100)
It can be written as
= (11/-9 × 21/44) + (5/9 × 63/100)
By further calculation
= (-1 × 7)/ (3 × 4) + (1 × 7)/ (1 × 20)
So we get
= -7/12 + 7/20
LCM of 12 and 20 is 60
= (-7 × 5)/ (12 × 5) + (7 × 3)/ (20 × 3)
Here
= -35/60 + 211/60
= (-35 + 21)/ 60
= -14/60
= -7/30

(iv) (-5/9 × 6/-25) + (24/21 × 7/8)
It can be written as
= (5/9 × 6/25) + (24/21 × 7/8)
By further calculation
= 2/ (3 × 5) + 1
= 2/15 + 1
LCM of 15 and 1 is 15
= (2 + 15)/ 15
= 17/15
= 1 2/15

(v) (-35/39 × -13/7) – (7/90 × -18/14)
It can be written as
= (-35/39 × -13/7) – (7/90 × -18/14)
By further calculation

= (-5 × -1)/ (3 × 1) – (1 × -1)/ (5 × 2)
So we get
= 5/3 – (-1/10)
LCM of 3 and 10 is 30
= (5 × 10)/ (3 × 10) + 1/ (10 × 3)
We get
= (50 + 3)/ 30
= 53/30
= 1 23/30

(vi) (-4/5 × 3/2) + (9/-5 × 10/3) – (-3/2 × -1/4)
It can be written as
= (-2 × 3)/ (5 × 1) + (3 × 2)/ (-1 × 1) – (-3 × -1)/ (2 × 4)
By further calculation
= -6/5 + -6/1 – 3/8
LCM of 5, 1 and 8 is 40
= = (-6 × 8)/ (5 × 8) – (6 × 40)/ (1 × 40) – (3 × 5)/ (8 × 5)
So we get
= (-48 – 240 – 15)/ 40
= - 303/40

4. Find the cost of 3 ½ m cloth, if one metre cloth costs ₹ 325 ½.
Solution:

It is given that cost of one metre cloth = ₹ 325 ½
We can write it as
= (2 × 325 + 1)/ 2
By further calculation
= (650 + 1)/ 2
= ₹ 651/2

Cost of 3 ½ m cloth
(2 × 3 + 1)/ 2 = 7/2 m
We get
= 651/2 × 7/2
It can be written as
= (651 × 7)/ (2 × 2)
= 4557/4
= ₹ 1139 ¼

5. A bus is moving with a speed of 65 ½ km per hour. How much distance will it cover in 1 1/3 hours.
Solution:

It is given that
Speed of bus = 65 ½ km per hour
We can write it as
= (2 × 65 + 1)/ 2
By further calculation
= (130 + 1)/ 2
= 131/ 2 km

Distance covered in 1 1/3 hour = 4/3 hour can be written as
= 131/2 × 4/3
We get
= 131/1 × 2/3
We know that distance covered = speed × time
= 131/2 × 4/3
= (131 × 2)/ (1 × 3)
So we get
= 262/3
= 87 1/3 km

6. Divide:
(i) 15/28 by ¾
(ii) -20/9 by -5/9
(iii) 16/-5 by -8/7
(iv) -7 by -14/5
(v) -14 by 7/-2
(vi) -22/9 by 11/18
(vii) 35 by -7/9
(viii) 21/44 by -11/9
Solution:

(i) 15/28 by ¾
We know that
= 15/28 ÷ 3/4
It can be written as
= 15/28 × 4/3
By further calculation
= 5/7 × 1/1
= 5/7

(ii) -20/9 by -5/9
We know that
= -20/9 ÷ -5/9
It can be written as
= -20/9 × 9/-5
By further calculation
= -4/-1
= 4

(iii) 16/-5 by -8/7
We know that
= 16/-5 ÷ -8/7
It can be written as
= 16/-5 × 7/-8
By further calculation
= 2/-5 × 7/-1
= (2 × 7)/ (-5 × -1)
So we get
= 14/5

= 2 4/5

(iv) -7 by -14/5
We know that
= -7 ÷ - 14/5
It can be written as
= -7 × 5/-14
By further calculation
= 1 × 5/2
= (1 × 5)/ 2
= 5/2
= 2 ½

(v) -14 by 7/-2
We know that
= -14 ÷ 7/-2
It can be written as
= -14 × -2/7
By further calculation
= (-2 × -2)/ (1 × 1)
= 4

(vi) -22/9 by 11/18
We know that
= - 22/9 ÷ 11/18
It can be written as
= -22/9 × 18/11
By further calculation
= -2/1 × 2/1
= (-2 × 2)/ (1 × 1)
= - 4/1
= - 4

(vii) 35 by -7/9
We know that
= 35 ÷ -7/9
It can be written as
= 35 × 9/-7
By further calculation
= 5 × 9/-1
So we get
= (5 × 9)/ -1
= 45/-1
= -45

(viii) 21/44 by -11/9
We know that
= 21/44 ÷ -11/9
It can be written as
= 21/44 × -9/11

By further calculation
= (21 × -9)/ (44 × 11)
= -189/484

7. Evaluate:
(i) 3 5/12 + 1 2/3
(ii) 3 5/12 – 1 2/3
(iii) (3 5/12 + 1 2/3) ÷ (3 5/12 – 1 2/3)
Solution:

(i) 3 5/12 + 1 2/3
It can be written as
= (12 × 3 + 5)/ 12 + (3 × 1 + 2)/ 3
= 41/12 + 5/3
LCM of 12 and 3 is 12
= (41 × 1)/ (12 × 1) + (5 × 4)/ (3 × 4)
By further calculation
= 41/12 + 20/12
= (41 + 20)/ 12
= 61/12
= 5 1/12

(ii) 3 5/12 – 1 2/3
It can be written as
= (12 × 3 + 5)/ 12 – (3 × 1 + 2)/ 3
= 41/12 – 5/3
LCM of 12 and 3 is 12
= (41 × 1)/ (12 × 1) – (5 × 4)/ (3 × 4)
By further calculation
= (41 – 20)/ 12
= 21/12
= 2/4
= 1 ¾

(iii) (3 5/12 + 1 2/3) ÷ (3 5/12 – 1 2/3)
It can be written as
= [(12 × 3 + 5)/ 12 + (3 × 1 + 2)/ 3] ÷ [(12 × 3 + 5)/ 12 – (3 × 1 + 2)/ 3]
= (41/12 + 5/3) ÷ (41/12 – 5/3)
LCM of 12 and 3 is 12
= (41 + 20)/ 12 ÷ (41 – 20)/ 12
By further calculation
= 61/12 ÷ 21/12
We can write it as
= 61/12 × 12/21
= 61/21
= 2 19/21

8. The product of two numbers is 14. If one of the numbers is -8/7, find the other.
Solution:

It is given that
Product of two numbers = 14
One of the number = -8/7
Other number = 14 ÷ -8/7
We can write it as
= 14 × -7/8
= -98/8
= - 49/4

9. The cost of 11 pens is ₹ 24 ¾. Find the cost of one pen.
Solution:

It is given that
Cost of 11 pens = ₹ 24 ¾
We can write it as
= (24 × 4 + 3)/ 4
= ₹ 99/4

So the cost of one pen = 99/4 ÷ 11
It can be written as
= 99/4 × 1/11
= ₹ 9/4
= ₹ 2 ¼

10. If 6 identical articles can be bought for ₹ 2 6/17. Find the cost of each article.
Solution:

It is given that
Cost of 6 articles = ₹ 2 6/17
We can write it as
= (2 × 17 + 6)/ 17
= ₹ 40/17

So the cost of each article = 40/17 ÷ 6
It can be written as
= 40/17 × 1/6
= ₹ 20/51

11. By what number should -3/8 be multiplied so that the product is -9/16?
Solution:

Number = -3/8 ÷ (-9/16)
We can write it as
= -3/8 × 16/-9
By further calculation
= 2/3
= 1 ½

12. By what number should -5/7 be divided so that the result is -15/28?
Solution:

Consider the number as x
-5/7 ÷ x = -15/28
It can be written as
-5/7 × 1/x = -15/28
By further calculation
-5/7x = -15/28
So we get
x = 5/7 × 28/15 = 4/3
x = 1 1/3

13. Evaluate: (32/15 + 8/5) ÷ (32/15 – 8/5).
Solution:

It is given that
(32/15 + 8/5) ÷ (32/15 – 8/5)
LCM of 15 and 5 is 15
= [(32 × 1)/ (15 × 1) + (8 × 3)/ (5 × 3)] ÷ [(32 × 1)/ (15 × 1) – (8 × 1)/ (5 × 1)]
By further calculation
= (32 + 24)/ 15 ÷ (32 – 24)/ 15
So we get
= 56/15 ÷ 8/15
= 56/15 × 15/8
= 7

14. Seven equal pieces are made out of a rope of 21 5/7 m. Find the length of each piece.
Solution:

It is given that
Length of 7 pieces of rope = 21 5/7 m
It can be written as
= (21 × 7 + 5)/ 7
= 152/7

So the length of each piece = 152/7 ÷ 7
We can write it as
= 152/7 × 1/7
So we get
= 152/49
= 3 5/49 m

EXERCISE 2E

1. 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 × 4)/ (3 × 4) + (3 × 3)/ (4 × 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 × 2)/ (-27 × 2) + (11 × 3)/ (18 × 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 × 3)/ (8 × 3) + (-5 × 2)/ (12 × 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 × 3)/ (-16 × 3) + (5 × 4)/ (12 × 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 × 4)/ (9 × 4) – (7 × 3)/ (12 × 3) + (11 × 2)/ (18 × 2)
By further calculation
= (-20 – 21 + 22)/ 36
So we get
= (-41 + 22)/ 36
= -19/36

(vi) 7/-26 + 16/39

2	26,39
3	13,39
13	13,13
	1,1

Here LCM of 26 and 39 is 78
So we get
= (-7 × 3)/ (26 × 3) + (16 × 2)/ (39 × 2)
By further calculation
= (-21 + 32)/ 78
= 11/78

(vii) -2/3 – (-5/7)
It can be written as
= -2/3 + 5/7

3	3,7
7	1,7
	1,1

Here LCM of 3 and 7 is 21
So we get
= (-2 × 7)/ (3 × 7) + (5 × 3)/ (7 × 3)
By further calculation
= (-14 + 15)/ 21
= 1/21

(viii) -5/7 – (-3/8)
It can be written as
= -5/7 + 3/8

2	7,8
2	7,4
2	7,2
7	7,1
	1,1

Here LCM of 7 and 8 is 56
So we get
= (-5 × 8)/ (7 × 8) + (3 × 7)/ (8 × 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

2	26,13
13	13,13
	1,1

Here LCM of 26 and 13 is 26
So we get
= (7 × 1)/ (26 × 1) + (2 × 26)/ (1 × 26) – (11 × 2)/ (13 × 2)
By further calculation
= (7 + 52 – 22)/ 26
So we get
= (59 – 22)/ 26
= 37/26
= 1 11/26

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

2	3,6
3	3,3
	1,1

Here LCM of 3 and 6 is 6
So we get
= (-1 × 6)/ (1 × 6) – (2 × 2)/ (3 × 2) + (5 × 1)/ (6 × 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
Sum of two rational numbers = -3/8
One rational number = 3/16
Other rational number = -3/8 – 3/16

2	8,16
2	4,8
2	2,4
2	1,2
	1,1

Here LCM of 8 and 16 is 16
So we get
= (-3 × 2)/ (8 × 2) – (3 × 1)/ (16 × 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 × 25)/ (1 × 25) + (52 × 1)/ (25 × 1)
By 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

Here LCM of 16 and 24 is 48
= (11 × 2)/ (24 × 2) + (3 × 3)/ (16 × 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 × 5)/ (1 × 5) + (3 × 1)/ (5 × 1)
By further calculation

= (10 + 3)/ 5
So we get
= 13/5
= 2 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 × 6)/ (12 × 6) – (5 × 3)/ (24 × 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 × 5)/ (8 × 5) – (8 × 8)/ (5 × 8)
By further calculation
= (25 – 64)/ 40
= -39/40

8. Evaluate:
(i) (7/8 × 24/21) + (-5/9 × 6/-25)
(ii) (8/15 × -25/16) + (-18/35 × 5/6)
(iii) (18/33 × -22/27) – (13/25 × -75/26)
(iv) (-13/7 × -35/39) – (-7/45 × 9/14)
Solution:

(i) (7/8 × 24/21) + (-5/9 × 6/-25)
It can be written as
= (7 × 24)/ (8 × 21) + (-5 × 6)/ (9 × -25)
By further simplification
= (1 × 3)/ (1 × 3) + (1 × 2)/ (3 × 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 × 5)/ (3 × 5) + (2 × 1)/ (15 × 1)
By further calculation
= (15 + 2)/ 15
= 17/15
= 1 2/15

(ii) (8/15 × -25/16) + (-18/35 × 5/6)
It can be written as
= (8 × -25)/ (15 × 16) + (-18 × 5)/ (35 × 6)
By further calculation
= (1 × -5)/ (3 × 2) + (-3 × 1)/ (7 × 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 × 7)/ (6 × 7) – (3 × 6)/ (7 × 6)
By further calculation
= (-35 – 18)/ 42
= -53/42

(iii) (18/33 × -22/27) – (13/25 × -75/26)
It can be written as
= (18 × -22)/ (33 × 27) – (13 × -75)/ (25 × 26)
By further calculation
= (2 × -2)/ (3 × 3) – (1 × -3)/ (1 × 2)
So we get
= -4/9 – (-3/2)
= -4/9 + 3/2

2	9,2
3	9,1
3	3,1
	1,1

Here LCM of 9 and 2 is 18
= (-4 × 2)/ (9 × 2) + (3 × 9)/ (2 × 9)
By further calculation
= (-8 + 27)/ 18
= 19/18
= 1 1/18

(iv) (-13/7 × -35/39) – (-7/45 × 9/14)
It can be written as
= (-13 × -35)/ (7 × 39) + (7 × 9)/ (45 × 14)
By further calculation
= (-1 × -5)/ (1 × 3) + (1 × 1)/ (5 × 2)
So we get
= 5/3 + 1/10

2	3,10
3	3,5
5	1,5
	1,1

Here the LCM of 3 and 10 is 30
= (5 × 10)/ (3 × 10) + (1 × 3)/ (10 × 3)
By further calculation
= (50 + 3)/ 30
= 53/30
= 1 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
Product of two rational numbers = 24
One rational number = -36/11
Other rational number = 24 ÷ (-36/ 11)
It can be written as
= 24 × (-11/36)
By further calculation
= 2 × (-11/3)
= -22/3

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

Here the required rational number = -5/9 ÷ (20/-9)

By further calculation
= -5/9 × (-9/20)
= 1/4