EXERCISE 5.1 PAGE NO: 5.4

1. Add the following rational numbers:
(i) (-5/7) and (3/7)
(ii) (-15/4) and (7/4)
(iii) (-8/11) and (-4/11)
(iv) (6/13) and (-9/13)

Solution:
(i) Given (-5/7) and (3/7)
= (-5/7) + (3/7)
Here denominators are same so add the numerator
= ((-5+3)/7)
= (-2/7)

(ii) Given (-15/4) and (7/4)
= (-15/4) + (7/4)
Here denominators are same so add the numerator
= ((-15 + 7)/4)
= (-8/4)
On simplifying
= -2

(iii) Given (-8/11) and (-4/11)
= (-8/11) + (-4/11)
Here denominators are same so add the numerator
= (-8 + (-4))/11
= (-12/11)

(iv) Given (6/13) and (-9/13)
= (6/13) + (-9/13)
Here denominators are same so add the numerator
= (6 + (-9))/13
= (-3/13)

2. Add the following rational numbers:
(i) (3/4) and (-3/5)

(ii) -3 and (3/5)
(iii) (-7/27) and (11/18)
(iv) (31/-4) and (-5/8)

Solution:
(i) Given (3/4) and (-3/5)
If p/q and r/s are two rational numbers such that q and s do not have a common factor other than one, then
(p/q) + (r/s) = (p × s + r × q)/ (q × s)
(3/4) + (-3/5) = (3 × 5 + (-3) × 4)/ (4 × 5)
= (15 – 12)/ 20
= (3/20)

(ii) Given -3 and (3/5)
If p/q and r/s are two rational numbers such that q and s do not have a common factor other than one, then
(p/q) + (r/s) = (p × s + r × q)/ (q × s)
(-3/1) + (3/5) = (-3 × 5 + 3 × 1)/ (1 × 5)
= (-15 + 3)/ 5
= (-12/5)

(iii) Given (-7/27) and (11/18)
LCM of 27 and 18 is 54
(-7/27) = (-7/27) × (2/2) = (-14/54)
(11/18) = (11/18) × (3/3) = (33/54)
(-7/27) + (11/18) = (-14 + 33)/54
= (19/54)

(iv) Given (31/-4) and (-5/8)
LCM of -4 and 8 is 8
(31/-4) = (31/-4) × (2/2) = (62/-8)
(31/-4) + (-5/8) = (-62 - 5)/8
= (-67/8)

3. Simplify:
(i) (8/9) + (-11/6)
(ii) (-5/16) + (7/24)

(iii) (1/-12) + (2/-15)
(iv) (-8/19) + (-4/57)

Solution:
(i) Given (8/9) + (-11/6)
The LCM of 9 and 6 is 18
(8/9) = (8/9) × (2/2) = (16/18)
(11/6) = (11/6) × (3/3) = (33/18)
= (16 – 33)/18
= (-17/18)

(ii) Given (-5/16) + (7/24)
The LCM of 16 and 24 is 48
Now (-5/16) = (-5/16) × (3/3) = (-15/48)
Consider (7/24) = (7/24) × (2/2) = (14/48)
(-5/16) + (7/24) = (-5/48) + (14/48)
= (14 – 15) /48
= (-1/48)

(iii) Given (1/-12) + (2/-15)
The LCM of 12 and 15 is 60
Consider (-1/12) = (-1/12) × (5/5) = (-5/60)
Now (2/-15) = (-2/15) × (4/4) = (-8/60)
(1/-12) + (2/-15) = (-5/60) + (-8/60)
= (-5 – 8)/60
= (-13/60)

(iv) Given (-8/19) + (-4/57)
The LCM of 19 and 57 is 57
Consider (-8/57) = (-8/57) × (3/3) = (-24/57)
(-8/19) + (-4/57) = (-24/57) + (-4/57)
= (-24 – 4)/57
= (-28/57)

4. Add and express the sum as mixed fraction:
(i) (-12/5) + (43/10)
(ii) (24/7) + (-11/4)

(iii) (-31/6) + (-27/8)

Solution:

(i) Given (-12/5) + (43/10)
The LCM of 5 and 10 is 10
Consider (-12/5) = (-12/5) × (2/2) = (-24/10)
(-12/5) + (43/10) = (-24/10) + (43/10)
= (-24 + 43)/10
= (19/10)
Now converting it into mixed fraction
= 1 (9/10)

(ii) Given (24/7) + (-11/4)
The LCM of 7 and 4 is 28
Consider (24/7) = (24/7) × (4/4) = (96/28)
Again (-11/4) = (-11/4) × (7/7) = (-77/28)
(24/7) + (-11/4) = (96/28) + (-77/28)
= (96 – 77)/28
= (19/28)

(iii) Given (-31/6) + (-27/8)
The LCM of 6 and 8 is 24
Consider (-31/6) = (-31/6) × (4/4) = (-124/24)
Again (-27/8) = (-27/8) × (3/3) = (-81/24)
(-31/6) + (-27/8) = (-124/24) + (-81/24)
= (-124 – 81)/24
= (-205/24)
Now converting it into mixed fraction
= -8 (13/24)

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)

EXERCISE 5.3

PAGE NO: 5.10

1. Multiply:
(i) (7/11) by (5/4)
(ii) (5/7) by (-3/4)
(iii) (-2/9) by (5/11)
(iv) (-3/13) by (-5/-4)

Solution:
(i) Given (7/11) by (5/4)
(7/11) × (5/4) = (35/44)

(ii) Given (5/7) by (-3/4)
(5/7) × (-3/4) = (-15/28)

(iii) Given (-2/9) by (5/11)
(-2/9) × (5/11) = (-10/99)

(iv) Given (-3/13) by (-5/-4)
(-3/13) × (-5/-4) = (-15/68)

2. Multiply:
(i) (-5/17) by (51/-60)
(ii) (-6/11) by (-55/36)
(iii) (-8/25) by (-5/16)
(iv) (6/7) by (-49/36)

Solution:
(i) Given (-5/17) by (51/-60)
(-5/17) × (51/-60) = (-225/- 1020)
= (225/1020)
= (1/4)

(ii) Given (-6/11) by (-55/36)
(-6/11) × (-55/36) = (330/ 396)
= (5/6)

(iii) Given (-8/25) by (-5/16)
(-8/25) × (-5/16) = (40/400)
= (1/10)

(iv) Given (6/7) by (-49/36)
(6/7) × (-49/36) = (-294/252)
= (-7/6)

3. Simplify each of the following and express the result as a rational number in standard form:
(i) (-16/21) × (14/5)
(ii) (7/6) × (-3/28)
(iii) (-19/36) × 16
(iv) (-13/9) × (27/-26)

Solution:
(i) Given (-16/21) × (14/5)
(-16/21) × (14/5) = (224/105)
= (-32/15)

(ii) Given (7/6) × (-3/28)
(7/6) × (-3/28) = (-21/168)
= (-1/8)

(iii) Given (-19/36) × 16
(-19/36) × 16 = (-304/36)
= (-76/9)

(iv) Given (-13/9) × (27/-26)
(-13/9) × (27/-26) = (-351/234)
= (3/2)

4. Simplify:
(i) (-5 × (2/15)) – (-6 × (2/9))
(ii) ((-9/4) × (5/3)) + ((13/2) × (5/6))

Solution:

(i) Given (-5 × (2/15)) – (-6 × (2/9))
(-5 × (2/15)) – (-6 × (2/9)) = (-10/15) – (-12/9)
= (-2/3) + (12/9)
= (-6/9) + (12/9)
= (6/9)
= (2/3)

(ii) Given ((-9/4) × (5/3)) + ((13/2) × (5/6))
((-9/4) × (5/3)) + ((13/2) × (5/6)) = ((-3/4) × 5) + ((13/2) × (5/6))
= (-15/4) + (65/12)
= (-15/4) × (3/3) + (65/12)
= (-45/12) + (65/12)
= (65 – 45)/12
= (20/12)
= (5/3)

5. Simplify:
(i) ((13/9) × (-15/2)) + ((7/3) × (8/5)) + ((3/5) × (1/2))
(ii) ((3/11) × (5/6)) – ((9/12) × ((4/3)) + ((5/13) × (6/15))

Solution:
(i) Given ((13/9) × (-15/2)) + ((7/3) × (8/5)) + ((3/5) × (1/2))
((13/9) × (-15/2)) + ((7/3) × (8/5)) + ((3/5) × (1/2)) = (-195/18) + (56/15) + (3/10)
= (-65/6) + (56/15) + (3/10)
= (-65/6) × (5/5) + (56/15) × (2/2) + (3/10) × (3/3).
= (-325/30) + (112/30) + (9/30)
= (-325 + 112 + 9)/30
= (-204/30)
= (-34/5)

(ii) Given ((3/11) × (5/6)) – ((9/12) × ((4/3)) + ((5/13) × (6/15))
((3/11) × (5/6)) – ((9/12) × ((4/3)) + ((5/13) × (6/15)) = (15/66) – (36/36) + (30/195)
= (5/22) – (12/12) + (1/11)
= (5/22) – 1 + (2/13)
= (5/22) × (13/13) + (1/1) × (286/286) + (2/13) × (22/22)
= (65/286) – (286/286) + (44/286)
= (-177/286)

EXERCISE 5.4 PAGE NO: 5.13

1. Divide:
(i) 1 by (1/2)
(ii) 5 by (-5/7)
(iii) (-3/4) by (9/-16)
(iv) (-7/8) by (-21/16)
(v) (7/-4) by (63/64)
(vi) 0 by (-7/5)
(vii) (-3/4) by -6
(viii) (2/3) by (-7/12)

Solution:
(i) Given 1 by (1/2)
1 ÷ (1/2) = 1 × 2 = 2

(ii) Given 5 by (-5/7)
5 ÷ (-5/7) = 5 × (-7/5)
= -7

(iii) Given (-3/4) by (9/-16)
(-3/4) ÷ (9/-16) = (-3/4) × (-16/9)
= (-4/-3)
= (4/3)

(iv) Given (-7/8) by (-21/16)
(-7/8) ÷ (-21/16) = (-7/8) × (16/-21)
= (-2/-3)
= (2/3)

(v) Given (7/-4) by (63/64)
(7/-4) ÷ (63/64) = (7/-4) × (64/63)
= (-16/9)

(vi) Given 0 by (-7/5)
0 ÷ (-7/5) = 0 × (5/7)
= 0

(vii) Given (-3/4) by -6
(-3/4) ÷ -6 = (-3/4) × (1/-6)
= (-1/-8)
= (1/8)

(viii) Given (2/3) by (-7/12)
(2/3) ÷ (-7/12) = (2/3) × (12/-7)
= (8/-7)

2. Find the value and express as a rational number in standard form:
(i) (2/5) ÷ (26/15)
(ii) (10/3) ÷ (-35/12)
(iii) -6 ÷ (-8/17)
(iv) (40/98) ÷ (-20)

Solution:
(i) Given (2/5) ÷ (26/15)
(2/5) ÷ (26/15) = (2/5) × (15/26)
= (3/13)

(ii) Given (10/3) ÷ (-35/12)
(10/3) ÷ (-35/12) = (10/3) × (12/-35)
= (-40/35)
= (- 8/7)

(iii) Given -6 ÷ (-8/17)
-6 ÷ (-8/17) = -6 × (17/-8)
= (102/8)
= (51/4)

(iv) Given (40/98) ÷ -20
(40/98) ÷ -20 = (40/98) × (1/-20)
= (-2/98)
= (-1/49)

3. The product of two rational numbers is 15. If one of the numbers is -10, find the other.

Solution:
Let required number be x
x × - 10 = 15
x = (15/-10)
x = (3/-2)
x = (-3/2)
Hence the number is (-3/2)

4. The product of two rational numbers is (- 8/9). If one of the numbers is (- 4/15), find the other.

Solution:
Given product of two numbers = (-8/9)
One of them is (-4/15)
Let the required number be x
x × (-4/15) = (-8/9)
x = (-8/9) ÷ (-4/15)
x = (-8/9) × (15/-4)
x = (-120/-36)
x = (10/3)

5. By what number should we multiply (-1/6) so that the product may be (-23/9)?

Solution:
Given product = (-23/9)
One number is (-1/6)
Let the required number be x
x × (-1/6) = (-23/9)
x = (-23/9) ÷ (-1/6)
x = (-23/9) × (-6/1)
x = (-138/9)
x = (46/3)

6. By what number should we multiply (-15/28) so that the product may be (-5/7)?

Solution:
Given product = (-5/7)

One number is (-15/28)
Let the required number be x
x × (-15/28) = (-5/7)
x = (-5/7) ÷ (-15/28)
x = (-5/7) × (28/-15)
x = (-4/-3)
x = (4/3)

7. By what number should we multiply (-8/13) so that the product may be 24?

Solution:
Given product = 24
One of the number is = (-8/13)
Let the required number be x
x × (-8/13) = 24
x = 24 ÷ (-8/13)
x = 24 × (13/-8)
x = -39

8. By what number should (-3/4) be multiplied in order to produce (-2/3)?

Solution:
Given product = (-2/3)
One of the number is = (-3/4)
Let the required number be x
x × (-3/4) = (-2/3)
x = (-2/3) ÷ (-3/4)
x = (-2/3) × (4/-3)
x = (-8/-9)
x = (8/9)

9. Find (x + y) ÷ (x - y), if
(i) x = (2/3), y = (3/2)
(ii) x = (2/5), y = (1/2)
(iii) x = (5/4), y = (-1/3)

Solution:

(i) Given x = (2/3), y = (3/2)
(x + y) ÷ (x - y) = ((2/3) + (3/2)) ÷ ((2/3) – (3/2))
= (4 + 9)/6 ÷ (4 – 9)/6
= (4 + 9)/6 × (6/ (4 – 9)
= (4 + 9)/ (4 -9)
= (13/-5)

(ii) Given x = (2/5), y = (1/2)
(x + y) ÷ (x - y) = ((2/5) + (1/2)) ÷ ((2/5) – (1/2))
= (4 + 5)/10 ÷ (4 -5)/10
= (4 + 5)/10 × (10/ (4 – 5)
= (4 + 5)/ (4 -5)
= (9/-1)

(iii) Given x = (5/4), y = (-1/3)
(x + y) ÷ (x - y) = ((5/4) + (-1/3)) ÷ ((5/4) – (-1/3))
= (15 - 4)/12 ÷ (15 + 4)/12
= (15 - 4)/12 × (12/ (15 + 4)
= (15 - 4)/ (15 + 4)
= (11/19)

10. The cost of 7 (2/3) meters of rope is Rs. 12 (3/4). Find its cost per meter.

Solution:
Given cost of 7 (2/3) = (23/3) meters of rope is Rs. 12 (3/4) = (51/4)
Cost per meter = (51/4) ÷ (23/3)
= (51/4) × (3/23)
= (153/92)
= Rs 1 (61/92)

11. The cost of 2 (1/3) meters of cloth is Rs.75 (1/4). Find the cost of cloth per meter.

Solution:
Given cost of 2(1/3) metres of rope = Rs. 75 (1/4)
Cost of cloth per meter = 75 (1/4) ÷ 2 (1/3)
= (301/4) ÷ (7/3)
= (301/4) × (3/7)

= (129/4)
= Rs 32 (1/4)

12. By what number should (-33/16) be divided to get (-11/4)?

Solution:
Let the required number be x
(-33/16) ÷ x = (-11/4)
x = (-33/16) ÷ (-11/4)
x = (-33/16) × (4/-11)
x = (3/4)

13. Divide the sum of (-13/5) and (12/7) by the product of (-31/7) and (-1/2)

Solution:
Given
((-13/5) + (12/7)) ÷ (-31/7) x (-1/2)
= ((-13/5) × (7/7) + (12/7) × (5/5)) ÷ (31/14)
= ((-91/35) + (60/35)) ÷ (31/14)
= (-31/35) ÷ (31/14)
= (-31/35) × (14/31)
= (-14/35)
= (-2/5)

14. Divide the sum of (65/12) and (8/3) by their difference.

Solution:
((65/12) + (8/3)) ÷ ((65/12) – (8/3))
= ((65/12) + (32/12)) ÷ ((65/12) – (32/12))
= (65 + 32)/12 ÷ (65 -32)/12
= (65 + 32)/12 × (12/ (65 - 32)
= (65 + 32)/ (65 - 32)
= (97/33)

15. If 24 trousers of equal size can be prepared in 54 metres of cloth, what length of cloth is required for each trouser?

Solution:

Given material required for 24 trousers = 54m

Cloth required for 1 trouser = (54/24)

= (9/4) meters

EXERCISE 5.5 PAGE NO: 5.16

1. Find six rational numbers between (-4/8) and (3/8)

Solution:
We know that between -4 and -8, below mentioned numbers will lie
-3, -2, -1, 0, 1, 2.
According to definition of rational numbers are in the form of (p/q) where q not equal to zero.
Therefore six rational numbers between (-4/8) and (3/8) are
(-3/8), (-2/8), (-1/8), (0/8), (1/8), (2/8), (3/8)

2. Find 10 rational numbers between (7/13) and (- 4/13)

Solution:
We know that between 7 and -4, below mentioned numbers will lie
-3, -2, -1, 0, 1, 2, 3, 4, 5, 6.
According to definition of rational numbers are in the form of (p/q) where q not equal to zero.
Therefore six rational numbers between (7/13) and (-4/13) are
(-3/13), (-2/13), (-1/13), (0/13), (1/13), (2/13), (3/13), (4/13), (5/13), (6/13)

3. State true or false:
(i) Between any two distinct integers there is always an integer.
(ii) Between any two distinct rational numbers there is always a rational number.
(iii) Between any two distinct rational numbers there are infinitely many rational numbers.

Solution:
(i) False

Explanation:
Between any two distinct integers not necessary to be one integer.

(ii) True

Explanation:
According to the properties of rational numbers between any two distinct rational numbers there is always a rational number.

(iii) True

Explanation:
According to the properties of rational numbers between any two distinct rational numbers there are infinitely many rational numbers.