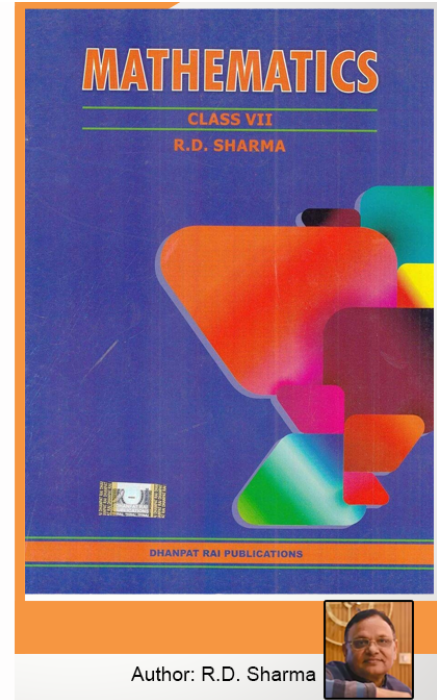


Class 7 - Chapter 5 Operations On Rational Numbers



RD Sharma Solutions for Class 7 Maths Chapter 5–Operations On Rational Numbers

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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

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$$= (-8 + (-4))/11$$

$$= (-12/11)$$

(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

$$(p/q) + (r/s) = (p \times s + r \times q) / (q \times s)$$

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

$$= (15 - 12) / 20$$

$$= (3/20)$$

(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

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$$(p/q) + (r/s) = (p \times s + r \times q) / (q \times s)$$

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

$$= (-15 + 3) / 5$$

$$= (-12/5)$$

(iii) Given $(-7/27)$ and $(11/18)$

LCM of 27 and 18 is 54

$$(-7/27) = (-7/27) \times (2/2) = (-14/54)$$

$$(11/18) = (11/18) \times (3/3) = (33/54)$$

$$(-7/27) + (11/18) = (-14 + 33) / 54$$

$$= (19/54)$$

(iv) Given $(31/-4)$ and $(-5/8)$

LCM of -4 and 8 is 8

$$(31/-4) = (31/-4) \times (2/2) = (62/-8)$$

$$(31/-4) + (-5/8) = (-62 - 5) / 8$$

$$= (-67/8)$$

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 $(8/9) + (-11/6)$

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The LCM of 9 and 6 is 18

$$(8/9) = (8/9) \times (2/2) = (16/18)$$

$$(-11/6) = (-11/6) \times (3/3) = (-33/18)$$

$$= (16 - 33)/18$$

$$= (-17/18)$$

(ii) Given $(-5/16) + (7/24)$

The LCM of 16 and 24 is 48

$$\text{Now } (-5/16) = (-5/16) \times (3/3) = (-15/48)$$

$$\text{Consider } (7/24) = (7/24) \times (2/2) = (14/48)$$

$$(-5/16) + (7/24) = (-15/48) + (14/48)$$

$$= (14 - 15)/48$$

$$= (-1/48)$$

(iii) Given $(1/-12) + (2/-15)$

The LCM of 12 and 15 is 60

$$\text{Consider } (-1/12) = (-1/12) \times (5/5) = (-5/60)$$

$$\text{Now } (2/-15) = (-2/15) \times (4/4) = (-8/60)$$

$$(1/-12) + (2/-15) = (-5/60) + (-8/60)$$

$$= (-5 - 8)/60$$

$$= (-13/60)$$

(iv) Given $(-8/19) + (-4/57)$

The LCM of 19 and 57 is 57

$$\text{Consider } (-8/57) = (-8/57) \times (3/3) = (-24/57)$$

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$$\begin{aligned}(-8/19) + (-4/57) &= (-24/57) + (-4/57) \\ &= (-24 - 4)/57 \\ &= (-28/57)\end{aligned}$$

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 $(-12/5) = (-12/5) \times (2/2) = (-24/10)$

$$(-12/5) + (43/10) = (-24/10) + (43/10)$$

$$= (-24 + 43)/10$$

$$= (19/10)$$

Now converting it into mixed fraction

$$= 1\frac{9}{10}$$

(ii) Given $(24/7) + (-11/4)$

The LCM of 7 and 4 is 28

Consider $(24/7) = (24/7) \times (4/4) = (96/28)$

Again $(-11/4) = (-11/4) \times (7/7) = (-77/28)$

$$(24/7) + (-11/4) = (96/28) + (-77/28)$$

$$= (96 - 77)/28$$

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$$= (19/28)$$

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

The LCM of 6 and 8 is 24

$$\text{Consider } (-31/6) = (-31/6) \times (4/4) = (-124/24)$$

$$\text{Again } (-27/8) = (-27/8) \times (3/3) = (-81/24)$$

$$(-31/6) + (-27/8) = (-124/24) + (-81/24)$$

$$= (-124 - 81)/24$$

$$= (-205/24)$$

Now converting it into mixed fraction

$$= -8\frac{13}{24}$$

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 $(3/8)$, $(5/8)$

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

$$= (2/8)$$

$$= (1/4)$$

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(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

$$\text{Consider } (2/3) = (2/3) \times (5/5) = (10/15)$$

$$\text{Now again } (3/5) = (3/5) \times (3/3) = (9/15)$$

$$(2/3) - (3/5) = (10/15) - (9/15)$$

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$$= (1/15)$$

(ii) Given $(-4/7) - (2/-3)$

The LCM of 7 and 3 is 21

$$\text{Consider } (-4/7) = (-4/7) \times (3/3) = (-12/21)$$

$$\text{Again } (2/-3) = (-2/3) \times (7/7) = (-14/21)$$

$$(-4/7) - (2/-3) = (-12/21) - (-14/21)$$

$$= (-12 + 14)/21$$

$$= (2/21)$$

(iii) Given $(4/7) - (-5/-7)$

$$(4/7) - (5/7) = (4 - 5)/7$$

$$= (-1/7)$$

(iv) Given $-2 - (5/9)$

$$\text{Consider } (-2/1) = (-2/1) \times (9/9) = (-18/9)$$

$$-2 - (5/9) = (-18/9) - (5/9)$$

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

$$= (-23/9)$$

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

$$x + (1/3) = (5/9)$$

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$$x = (5/9) - (1/3)$$

LCM of 3 and 9 is 9

$$\text{Consider } (1/3) = (1/3) \times (3/3) = (3/9)$$

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:

$$\text{Given sum of two numbers} = (-1/3)$$

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:

$$\text{Given sum of two numbers} = (-4/3)$$

One of them is -5

Let the required number be x

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$$x + (-5) = (-4/3)$$

LCM of 1 and 3 is 3

$$(-5/1) = (-5/1) \times (3/3) = (-15/3)$$

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

$$\text{Consider } (-8/1) = (-8/1) \times (7/7) = (-56/7)$$

On substituting

$$x + (-15/7) = (-56/7)$$

$$x = (-56/7) - (-15/7)$$

$$x = (-56/7) + (15/7)$$

$$x = (-56 + 15)/7$$

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$$x = (-41/7)$$

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

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

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

$$\text{Consider } (5/9) = (5/9) \times (8/8) = (40/72)$$

$$\text{Again } (7/8) = (7/8) \times (9/8) = (63/72)$$

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

$$x + (-5/11) = (26/33)$$

$$x = (26/33) - (-5/11)$$

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

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Consider $(5/11) = (5/11) \times (3/3) = (15/33)$

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

$$\text{Consider } (-2/3) = (-2/3) \times (7/7) = (-14/21)$$

$$\text{Again } (5/7) = (5/7) \times (3/3) = (15/21)$$

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

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

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

$$-x = (5/6) + (5/3)$$

$$\text{Consider } (5/3) = (5/3) \times (2/2) = (10/6)$$

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

$$\text{Consider } (5/4) = (5/4) \times (7/7) = (35/28)$$

$$\text{Again } (3/7) = (3/7) \times (4/4) = (12/28)$$

On substituting

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

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

$$-x = (23/28)$$

$$x = (-23/28)$$

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12. What should be added to $((\frac{2}{3}) + (\frac{3}{5}))$ to get $(-\frac{2}{15})$?

Solution:

Given $((\frac{2}{3}) + (\frac{3}{5}))$

Let the required number be x

$$((\frac{2}{3}) + (\frac{3}{5})) + x = (-\frac{2}{15})$$

$$\text{Consider } (\frac{2}{3}) = (\frac{2}{3}) \times (\frac{5}{5}) = (\frac{10}{15})$$

$$\text{Again } (\frac{3}{5}) = (\frac{3}{5}) \times (\frac{3}{3}) = (\frac{9}{15})$$

On substituting

$$((\frac{10}{15}) + (\frac{9}{15})) + x = (-\frac{2}{15})$$

$$x = (-\frac{2}{15}) - ((\frac{10}{15}) + (\frac{9}{15}))$$

$$x = (-\frac{2}{15}) - (\frac{19}{15})$$

$$x = (-2 - 19)/15$$

$$x = (-21/15)$$

$$x = (-7/5)$$

13. What should be added to $((\frac{1}{2}) + (\frac{1}{3}) + (\frac{1}{5}))$ to get 3?

Solution:

Given $((\frac{1}{2}) + (\frac{1}{3}) + (\frac{1}{5}))$

Let the required number be x

$$((\frac{1}{2}) + (\frac{1}{3}) + (\frac{1}{5})) + x = 3$$

$$x = 3 - ((\frac{1}{2}) + (\frac{1}{3}) + (\frac{1}{5}))$$

LCM of 2, 3 and 5 is 30

$$\text{Consider } (\frac{1}{2}) = (\frac{1}{2}) \times (\frac{15}{15}) = (\frac{15}{30})$$

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$$(1/3) = (1/3) \times (10/10) = (10/30)$$

$$(1/5) = (1/5) \times (6/6) = (6/30)$$

On substituting

$$x = 3 - ((15/30) + (10/30) + (6/30))$$

$$x = 3 - (31/30)$$

$$(3/1) = (3/1) \times (30/30) = (90/30)$$

$$x = (90/30) - (31/30)$$

$$x = (90 - 31)/30$$

$$x = (59/30)$$

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

Solution:

$$\text{Given } ((3/4) - (2/3))$$

Let the required number be x

$$((3/4) - (2/3)) - x = (-1/6)$$

$$-x = (-1/6) - ((3/4) - (2/3))$$

$$\text{Consider } (3/4) = (3/4) \times (3/3) = (9/12)$$

$$(2/3) = (2/3) \times (4/4) = (8/12)$$

On substituting

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

$$-x = (-1/6) - (1/12)$$

$$(1/6) = (1/6) \times (2/2) = (2/12)$$

$$-x = (-2/12) - (1/12)$$

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$$-x = (-2 - 1)/12$$

$$-x = (-3/12)$$

$$x = (3/12)$$

$$x = (1/4)$$

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

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 $(5/3) = (5/3) \times (2/2) = (10/6)$

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

$$(5/3) - (7/6) + (-2/3) = (10/6) - (7/6) - (4/6)$$

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$$= (10 - 7 - 4)/6$$

$$= (10 - 11)/6$$

$$= (-1/6)$$

(iii) Given $(5/4) - (7/6) - (-2/3)$

The LCM of 4, 6 and 3 is 12

Consider $(5/4) = (5/4) \times (3/3) = (15/12)$

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

$$(-2/3) = (-2/3) \times (4/4) = (-8/12)$$

$$(5/4) - (7/6) - (-2/3) = (15/12) - (14/12) + (8/12)$$

$$= (15 - 14 + 8)/12$$

$$= (9/12)$$

$$= (3/4)$$

(iv) Given $(-2/5) - (-3/10) - (-4/7)$

The LCM of 5, 10 and 7 is 70

Consider $(-2/5) = (-2/5) \times (14/14) = (-28/70)$

$$(-3/10) = (-3/10) \times (7/7) = (-21/70)$$

$$(-4/7) = (-4/7) \times (10/10) = (-40/70)$$

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:

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

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

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

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

Solution:

(i) $(-5/26)$

Explanation:

Consider $(-4/13) - (-3/26)$

$$(-4/13) = (-4/13) \times (2/2) = (-8/26)$$

$$(-4/13) - (-3/26) = (-8/26) - (-3/26)$$

$$= (-5/26)$$

(ii) $(-5/14)$

Explanation:

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

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

$$(-9/14) + (14/14) = (5/14)$$

$$(-9/14) + (-5/14) = -1$$

(iii) $(34/9)$

Explanation:

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

$$(-7/9) + x = 3$$

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

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$$(3/1) = (3/1) \times (9/9) = (27/9)$$

$$x = (27/9) + (7/9) = (34/9)$$

$$(iv) (77/23)$$

Explanation:

$$\text{Given } \dots + (15/23) = 4$$

$$x + (15/23) = 4$$

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

$$(4/1) = (4/1) \times (23/23) = (92/23)$$

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

$$= (77/23)$$

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 $(5/4)$

$$(7/11) \times (5/4) = (35/44)$$

(ii) Given $(5/7)$ by $(-3/4)$

$$(5/7) \times (-3/4) = (-15/28)$$

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(iii) Given $(-2/9)$ by $(5/11)$

$$(-2/9) \times (5/11) = (-10/99)$$

(iv) Given $(-3/13)$ by $(-5/-4)$

$$(-3/13) \times (-5/-4) = (-15/68)$$

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 $(51/-60)$

$$(-5/17) \times (51/-60) = (-225/-1020)$$

$$= (225/1020)$$

$$= (1/4)$$

(ii) Given $(-6/11)$ by $(-55/36)$

$$(-6/11) \times (-55/36) = (330/396)$$

$$= (5/6)$$

(iii) Given $(-8/25)$ by $(-5/16)$

$$(-8/25) \times (-5/16) = (40/400)$$

$$= (1/10)$$

(iv) Given $(6/7)$ by $(-49/36)$

$$(6/7) \times (-49/36) = (-294/252)$$

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$$= (-7/6)$$

3. Simplify each of the following and express the result as a rational number in standard form:

(i) $(-16/21) \times (14/5)$

(ii) $(7/6) \times (-3/28)$

(iii) $(-19/36) \times 16$

(iv) $(-13/9) \times (27/-26)$

Solution:

(i) Given $(-16/21) \times (14/5)$

$$(-16/21) \times (14/5) = (-224/105)$$

$$= (-32/15)$$

(ii) Given $(7/6) \times (-3/28)$

$$(7/6) \times (-3/28) = (-21/168)$$

$$= (-1/8)$$

(iii) Given $(-19/36) \times 16$

$$(-19/36) \times 16 = (-304/36)$$

$$= (-76/9)$$

(iv) Given $(-13/9) \times (27/-26)$

$$(-13/9) \times (27/-26) = (-351/234)$$

$$= (3/2)$$

4. Simplify:

(i) $(-5 \times (2/15)) - (-6 \times (2/9))$

(ii) $((-9/4) \times (5/3)) + ((13/2) \times (5/6))$

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Solution:

(i) Given $(-5 \times (2/15)) - (-6 \times (2/9))$

$$(-5 \times (2/15)) - (-6 \times (2/9)) = (-10/15) - (-12/9)$$

$$= (-2/3) + (12/9)$$

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

$$= (6/9)$$

$$= (2/3)$$

(ii) Given $((-9/4) \times (5/3)) + ((13/2) \times (5/6))$

$$((-9/4) \times (5/3)) + ((13/2) \times (5/6)) = ((-3/4) \times 5) + ((13/2) \times (5/6))$$

$$= (-15/4) + (65/12)$$

$$= (-15/4) \times (3/3) + (65/12)$$

$$= (-45/12) + (65/12)$$

$$= (65 - 45)/12$$

$$= (20/12)$$

$$= (5/3)$$

5. Simplify:

(i) $((13/9) \times (-15/2)) + ((7/3) \times (8/5)) + ((3/5) \times (1/2))$

(ii) $((3/11) \times (5/6)) - ((9/12) \times ((4/3)) + ((5/13) \times (6/15))$

Solution:

(i) Given $((13/9) \times (-15/2)) + ((7/3) \times (8/5)) + ((3/5) \times (1/2))$

$$((13/9) \times (-15/2)) + ((7/3) \times (8/5)) + ((3/5) \times (1/2)) = (-195/18) + (56/15) + (3/10)$$

$$= (-65/6) + (56/15) + (3/10)$$

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$$= (-65/6) \times (5/5) + (56/15) \times (2/2) + (3/10) \times (3/3).$$

$$= (-325/30) + (112/30) + (9/30)$$

$$= (-325 + 112 + 9)/30$$

$$= (-204/30)$$

$$= (-34/5)$$

(ii) Given $((3/11) \times (5/6)) - ((9/12) \times ((4/3)) + ((5/13) \times (6/15))$

$$((3/11) \times (5/6)) - ((9/12) \times ((4/3)) + ((5/13) \times (6/15)) = (15/66) - (36/36) + (30/195)$$

$$= (5/22) - (12/12) + (1/11)$$

$$= (5/22) - 1 + (2/13)$$

$$= (5/22) \times (13/13) + (1/1) \times (286/286) + (2/13) \times (22/22)$$

$$= (65/286) - (286/286) + (44/286)$$

$$= (-177/286)$$

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

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(viii) $(2/3)$ by $(-7/12)$

Solution:

(i) Given 1 by $(1/2)$

$$1 \div (1/2) = 1 \times 2 = 2$$

(ii) Given 5 by $(-5/7)$

$$5 \div (-5/7) = 5 \times (-7/5)$$

$$= -7$$

(iii) Given $(-3/4)$ by $(9/-16)$

$$(-3/4) \div (9/-16) = (-3/4) \times (-16/9)$$

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

$$= (4/3)$$

(iv) Given $(-7/8)$ by $(-21/16)$

$$(-7/8) \div (-21/16) = (-7/8) \times (16/-21)$$

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

$$= (2/3)$$

(v) Given $(7/-4)$ by $(63/64)$

$$(7/-4) \div (63/64) = (7/-4) \times (64/63)$$

$$= (-16/9)$$

(vi) Given 0 by $(-7/5)$

$$0 \div (-7/5) = 0 \times (5/7)$$

$$= 0$$

(vii) Given $(-3/4)$ by -6

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

$$= (-1/-8)$$

$$= (1/8)$$

(viii) Given $(2/3)$ by $(-7/12)$

$$(2/3) \div (-7/12) = (2/3) \times (12/-7)$$

$$= (8/-7)$$

2. Find the value and express as a rational number in standard form:

(i) $(2/5) \div (26/15)$

(ii) $(10/3) \div (-35/12)$

(iii) $-6 \div (-8/17)$

(iv) $(40/98) \div (-20)$

Solution:

(i) Given $(2/5) \div (26/15)$

$$(2/5) \div (26/15) = (2/5) \times (15/26)$$

$$= (3/13)$$

(ii) Given $(10/3) \div (-35/12)$

$$(10/3) \div (-35/12) = (10/3) \times (12/-35)$$

$$= (-40/35)$$

$$= (-8/7)$$

(iii) Given $-6 \div (-8/17)$

$$-6 \div (-8/17) = -6 \times (17/-8)$$

$$= (102/8)$$

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$$= (51/4)$$

(iv) Given $(40/98) \div -20$

$$(40/98) \div -20 = (40/98) \times (1/-20)$$

$$= (-2/98)$$

$$= (-1/49)$$

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

$$x \times -10 = 15$$

$$x = (15/-10)$$

$$x = (3/-2)$$

$$x = (-3/2)$$

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

$$x \times (-4/15) = (-8/9)$$

$$x = (-8/9) \div (-4/15)$$

$$x = (-8/9) \times (15/-4)$$

$$x = (-120/-36)$$

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$$x = (10/3)$$

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

Solution:

$$\text{Given product} = (-23/9)$$

$$\text{One number is } (-1/6)$$

Let the required number be x

$$x \times (-1/6) = (-23/9)$$

$$x = (-23/9) \div (-1/6)$$

$$x = (-23/9) \times (-6/1)$$

$$x = (138/9)$$

$$x = (46/3)$$

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

Solution:

$$\text{Given product} = (-5/7)$$

$$\text{One number is } (-15/28)$$

Let the required number be x

$$x \times (-15/28) = (-5/7)$$

$$x = (-5/7) \div (-15/28)$$

$$x = (-5/7) \times (28/-15)$$

$$x = (-4/-3)$$

$$x = (4/3)$$

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

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Solution:

Given product = 24

One of the number is = $(-8/13)$

Let the required number be x

$$x \times (-8/13) = 24$$

$$x = 24 \div (-8/13)$$

$$x = 24 \times (13/-8)$$

$$x = -39$$

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

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

$$x = (-2/3) \div (-3/4)$$

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

$$x = (-8/-9)$$

$$x = (8/9)$$

9. Find $(x + y) \div (x - y)$, if

(i) $x = (2/3)$, $y = (3/2)$

(ii) $x = (2/5)$, $y = (1/2)$

(iii) $x = (5/4)$, $y = (-1/3)$

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Solution:

(i) Given $x = (2/3)$, $y = (3/2)$

$$(x + y) \div (x - y) = ((2/3) + (3/2)) \div ((2/3) - (3/2))$$

$$= (4 + 9)/6 \div (4 - 9)/6$$

$$= (4 + 9)/6 \times (6/ (4 - 9))$$

$$= (4 + 9)/ (4 -9)$$

$$= (13/-5)$$

(ii) Given $x = (2/5)$, $y = (1/2)$

$$(x + y) \div (x - y) = ((2/5) + (1/2)) \div ((2/5) - (1/2))$$

$$= (4 + 5)/10 \div (4 -5)/10$$

$$= (4 + 5)/10 \times (10/ (4 - 5))$$

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

$$= (9/-1)$$

(iii) Given $x = (5/4)$, $y = (-1/3)$

$$(x + y) \div (x - y) = ((5/4) + (-1/3)) \div ((5/4) - (-1/3))$$

$$= (15 - 4)/12 \div (15 + 4)/12$$

$$= (15 - 4)/12 \times (12/ (15 + 4))$$

$$= (15 - 4)/ (15 + 4)$$

$$= (11/19)$$

10. The cost of 723723 meters of rope is Rs. 12341234. Find its cost per meter.

Solution:

Given cost of 723723 = $(23/3)$ meters of rope is Rs. 12341234 = $(51/4)$

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$$\text{Cost per meter} = (51/4) \div (23/3)$$

$$= (51/4) \times (3/23)$$

$$= (153/92)$$

$$= \text{Rs } 1619216192$$

11. The cost of 213213 meters of cloth is Rs.75147514. Find the cost of cloth per meter.

Solution:

Given cost of 213213 metres of rope = Rs. 75147514

Cost of cloth per meter = $75147514 \div 213213$

$$= (301/4) \div (7/3)$$

$$= (301/4) \times (3/7)$$

$$= (129/4)$$

$$= \text{Rs } 32143214$$

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

Solution:

Let the required number be x

$$(-33/16) \div x = (-11/4)$$

$$x = (-33/16) \div (-11/4)$$

$$x = (-33/16) \times (4/-11)$$

$$x = (3/4)$$

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

Solution:

Given

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$$\begin{aligned} &((-13/5) + (12/7)) \div (-31/7) \times (-1/2) \\ &= ((-13/5) \times (7/7) + (12/7) \times (5/5)) \div (31/14) \\ &= ((-91/35) + (60/35)) \div (31/14) \\ &= (-31/35) \div (31/14) \\ &= (-31/35) \times (14/31) \\ &= (-14/35) \\ &= (-2/5) \end{aligned}$$

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

Solution:

$$\begin{aligned} &((65/12) + (8/3)) \div ((65/12) - (8/3)) \\ &= ((65/12) + (32/12)) \div ((65/12) - (32/12)) \\ &= (65 + 32)/12 \div (65 - 32)/12 \\ &= (65 + 32)/12 \times (12/ (65 - 32)) \\ &= (65 + 32)/ (65 - 32) \\ &= (97/33) \end{aligned}$$

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

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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.

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(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.



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About RD Sharma

RD Sharma isn't the kind of author you'd bump into at lit fests. But his bestselling books have helped many CBSE students lose their dread of maths. Sunday Times profiles the tutor turned internet star

He dreams of algorithms that would give most people nightmares. And, spends every waking hour thinking of ways to explain concepts like 'series solution of linear differential equations'. Meet Dr Ravi Dutt Sharma — mathematics teacher and author of 25 reference books — whose name evokes as much awe as the subject he teaches. And though students have used his thick tomes for the last 31 years to ace the dreaded maths exam, it's only recently that a spoof video turned the tutor into a YouTube star.

R D Sharma had a good laugh but said he shared little with his on-screen persona except for the love for maths. "I like to spend all my time thinking and writing about maths problems. I find it relaxing," he says. When he is not writing books explaining mathematical concepts for classes 6 to 12 and engineering students, Sharma is busy dispensing his duty as vice-principal and head of department of science and humanities at Delhi government's Guru Nanak Dev Institute of Technology.

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