

CHAPTER 4

Rational Numbers

1. List five rational numbers between:

(i) -1 and 0

Solution:-

The five rational numbers between -1 and 0 are,

$$-1 < (-2/3) < (-3/4) < (-4/5) < (-5/6) < (-6/7) < 0$$

(ii) -2 and -1

Solution:-

The five rational numbers between -2 and -1 are,

$$-2 < (-8/7) < (-9/8) < (-10/9) < (-11/10) < (-12/11) < -1$$

(iii) -4/5 and -2/3

Solution:-

The five rational numbers between -4/5 and -2/3 are,

$$-4/5 < (-13/12) < (-14/13) < (-15/14) < (-16/15) < (-17/16) < -2/3$$

(iv) -1/2 and 2/3

Solution:-

The five rational numbers between -1/2 and 2/3 are,

$$-1/2 < (-1/6) < (0) < (1/3) < (1/2) < (20/36) < 2/3$$

2. Write four more rational numbers in each of the following patterns:

(i) -3/5, -6/10, -9/15, -12/20,

Solution:-

In the above question, we can observe that the numerator and denominator are multiples of 3 and 5.

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

Then, the next four rational numbers in this pattern are,

$$= (-3 \times 5) / (5 \times 5), (-3 \times 6) / (5 \times 6), (-3 \times 7) / (5 \times 7), (-3 \times 8) / (5 \times 8)$$

$$= -15/25, -18/30, -21/35, -24/40 \dots$$

(ii) -1/4, -2/8, -3/12,

Solution:-

In the above question, we can observe that the numerator and denominator are multiples of 1 and 4.

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

Then, the next four rational numbers in this pattern are,

$$= (-1 \times 4) / (4 \times 4), (-1 \times 5) / (4 \times 5), (-1 \times 6) / (4 \times 6), (-1 \times 7) / (4 \times 7)$$

$$= -4/16, -5/20, -6/24, -7/28 \dots$$

(iii) -1/6, 2/-12, 3/-18, 4/-24

Solution:-

In the above question, we can observe that the numerator and denominator are multiples of 1 and 6.

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

Then, the next four rational numbers in this pattern are,

$$= (1 \times 5) / (-6 \times 5), (1 \times 6) / (-6 \times 6), (1 \times 7) / (-6 \times 7), (1 \times 8) / (-6 \times 8)$$

$$= 5/-30, 6/-36, 7/-42, 8/-48 \dots$$

(iv) -2/3, 2/-3, 4/-6, 6/-9

Solution:-

In the above question, we can observe that the numerator and denominator are the multiples of 2 and 3.

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

Then, the next four rational numbers in this pattern are,

$$= (2 \times 4) / (-3 \times 4), (2 \times 5) / (-3 \times 5), (2 \times 6) / (-3 \times 6), (2 \times 7) / (-3 \times 7)$$

$$= 8/-12, 10/-15, 12/-18, 14/-21 \dots$$

3. Give four rational numbers equivalent to:

(i) $-2/7$

Solution:-

The four rational numbers equivalent to $-2/7$ are,

$$= (-2 \times 2) / (7 \times 2), (-2 \times 3) / (7 \times 3), (-2 \times 4) / (7 \times 4), (-2 \times 5) / (7 \times 5)$$

$$= -4/14, -6/21, -8/28, -10/35$$

(ii) $5/-3$

Solution:-

The four rational numbers equivalent to $5/-3$ are,

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

$$= 10/-6, 15/-9, 20/-12, 25/-15$$

(iii) $4/9$

Solution:-

The four rational numbers equivalent to $4/9$ are,

$$= (4 \times 2) / (9 \times 2), (4 \times 3) / (9 \times 3), (4 \times 4) / (9 \times 4), (4 \times 5) / (9 \times 5)$$

$$= 8/18, 12/27, 16/36, 20/45$$

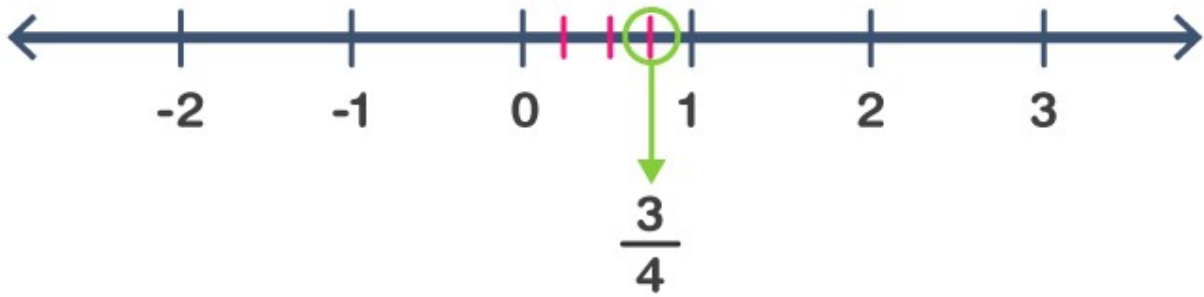
4. Draw the number line and represent the following rational numbers on it:

(i) $\frac{3}{4}$

Solution:-

We know that $\frac{3}{4}$ is greater than 0 and less than 1.

\therefore it lies between 0 and 1. It can be represented on the number line as,

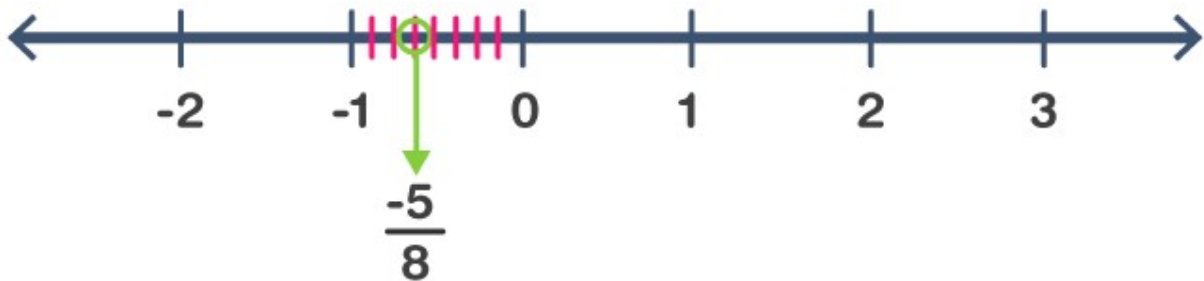


(ii) $-\frac{5}{8}$

Solution:-

We know that $-\frac{5}{8}$ is less than 0 and greater than -1.

\therefore it lies between 0 and -1. It can be represented on the number line as,



(iii) $-\frac{7}{4}$

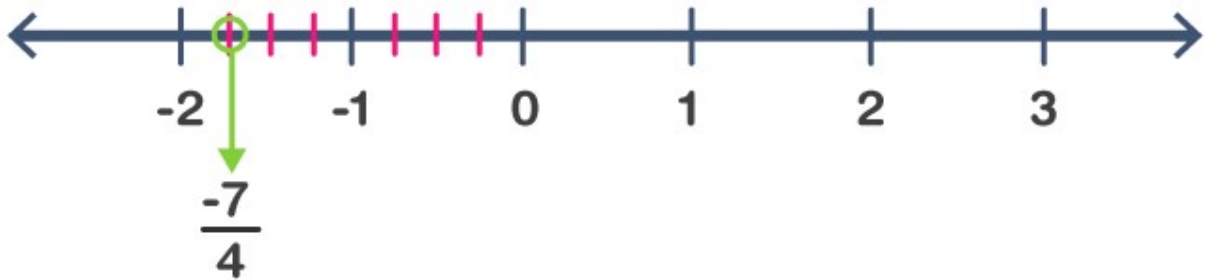
Solution:-

Now, the above question can be written as,

$$= (-\frac{7}{4}) = -1\frac{3}{4}$$

We know that $(-7/4)$ is less than -1 and greater than -2 .

\therefore it lies between -1 and -2 . It can be represented on the number line as,

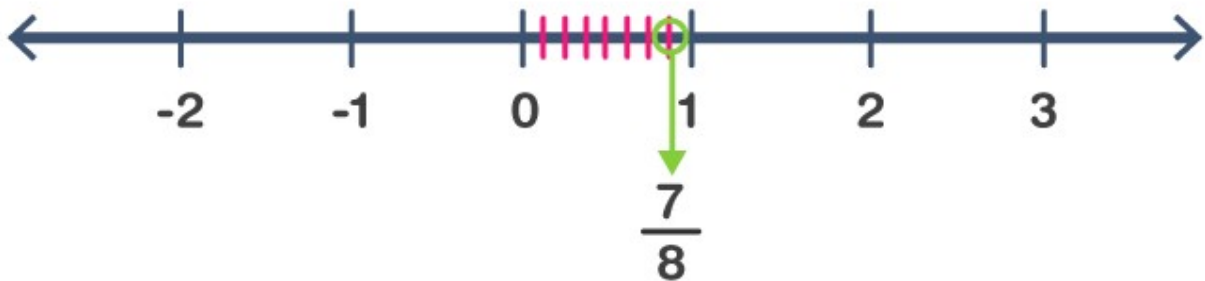


(iv) $7/8$

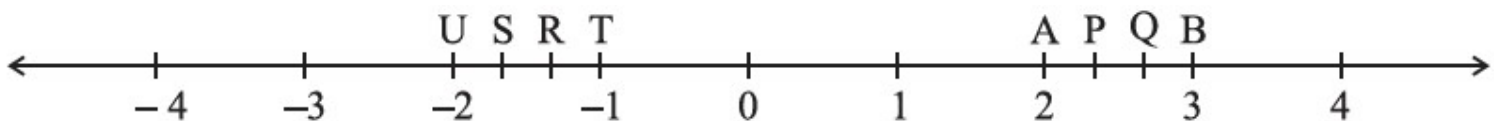
Solution:-

We know that $7/8$ is greater than 0 and less than 1 .

\therefore it lies between 0 and 1 . It can be represented on the number line as,



5. The points P, Q, R, S, T, U, A and B on the number line are such that, $TR = RS = SU$ and $AP = PQ = QB$. Name the rational numbers represented by P, Q, R and S.



Solution:-

By observing the figure, we can say that,

The distance between A and B = 1 unit

And it is divided into 3 equal parts = $AP = PQ = QB = 1/3$

$$P = 2 + (1/3)$$

$$= (6 + 1)/ 3$$

$$= 7/3$$

$$Q = 2 + (2/3)$$

$$= (6 + 2)/ 3$$

$$= 8/3$$

Similarly,

The distance between U and T = 1 unit

And it is divided into 3 equal parts = $TR = RS = SU = 1/3$

$$R = - 1 - (1/3)$$

$$= (- 3 - 1)/ 3$$

$$= - 4/3$$

$$S = - 1 - (2/3)$$

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

$$= - 5/3$$

6. Which of the following pairs represents the same rational number?

(i) $(-7/21)$ and $(3/9)$

Solution:-

We have to check if the given pair represents the same rational number.

Then,

$$-7/21 = 3/9$$

$$-1/3 = 1/3$$

$$\therefore -1/3 \neq 1/3$$

$$\therefore -7/21 \neq 3/9$$

So, the given pair does not represent the same rational number.

(ii) (-16/20) and (20/-25)

Solution:-

We have to check if the given pair represents the same rational number.

Then,

$$-16/20 = 20/-25$$

$$-4/5 = 4/-5$$

$$\therefore -4/5 = -4/5$$

$$\therefore -16/20 = 20/-25$$

So, the given pair represents the same rational number.

(iii) (-2/-3) and (2/3)

Solution:-

We have to check if the given pair represents the same rational number.

Then,

$$-2/-3 = 2/3$$

$$2/3 = 2/3$$

$$\therefore 2/3 = 2/3$$

$$\therefore -2/-3 = 2/3$$

So, the given pair represents the same rational number.

(iv) $(-3/5)$ and $(-12/20)$

Solution:-

We have to check if the given pair represents the same rational number.

Then,

$$-3/5 = -12/20$$

$$-3/5 = -3/5$$

$$\therefore -3/5 = -3/5$$

$$\therefore -3/5 = -12/20$$

So, the given pair represents the same rational number.

(v) $(8/-5)$ and $(-24/15)$

Solution:-

We have to check if the given pair represents the same rational number.

Then,

$$8/-5 = -24/15$$

$$8/-5 = -8/5$$

$$\therefore -8/5 = -8/5$$

$$\therefore 8/-5 = -24/15$$

So, the given pair represents the same rational number.

(vi) $(1/3)$ and $(-1/9)$

Solution:-

We have to check if the given pair represents the same rational number.

Then,

$$1/3 \neq -1/9$$

$$\therefore 1/3 \neq -1/9$$

$$\therefore 1/3 \neq -1/9$$

So, the given pair does not represent the same rational number.

(vii) $(-5/-9)$ and $(5/-9)$

Solution:-

We have to check if the given pair represents the same rational number.

Then,

$$-5/-9 = 5/-9$$

$$\therefore 5/9 \neq -5/9$$

$$\therefore -5/-9 \neq 5/-9$$

So, the given pair does not represent the same rational number.

7. Rewrite the following rational numbers in the simplest form:

(i) $-8/6$

Solution:-

The given rational numbers can be simplified further,

Then,

$$= -4/3 \dots [\because \text{Divide both numerator and denominator by 2}]$$

(ii) $25/45$

Solution:-

The given rational numbers can be simplified further,

Then,

$$= 5/9 \dots [\because \text{Divide both numerator and denominator by 5}]$$

(iii) $-44/72$

Solution:-

The given rational numbers can be simplified further,

Then,

$$= -11/18 \dots [\because \text{Divide both numerator and denominator by 4}]$$

(iv) $-8/10$

Solution:-

The given rational numbers can be simplified further,

Then,

$$= -4/5 \dots [\because \text{Divide both numerator and denominator by 2}]$$

8. Fill in the boxes with the correct symbol out of $>$, $<$, and $=$.

(i) $-5/7$ [] $2/3$

Solution:-

The LCM of the denominators 7 and 3 is 21

$$\therefore (-5/7) = [(-5 \times 3)/(7 \times 3)] = (-15/21)$$

$$\text{And } (2/3) = [(2 \times 7)/(3 \times 7)] = (14/21)$$

Now,

$$-15 < 14$$

$$\text{So, } (-15/21) < (14/21)$$

$$\text{Hence, } -5/7 [<] 2/3$$

(ii) $-4/5$ [] $-5/7$

Solution:-

The LCM of the denominators 5 and 7 is 35

$$\therefore (-4/5) = [(-4 \times 7) / (5 \times 7)] = (-28/35)$$

$$\text{And } (-5/7) = [(-5 \times 5) / (7 \times 5)] = (-25/35)$$

Now,

$$-28 < -25$$

$$\text{So, } (-28/35) < (-25/35)$$

$$\text{Hence, } -4/5 [<] -5/7$$

$$\text{(iii) } -7/8 [] 14/-16$$

Solution:-

14/-16 can be simplified further,

Then,

$$7/-8 \dots [\because \text{Divide both numerator and denominator by 2}]$$

$$\text{So, } (-7/8) = (-7/8)$$

$$\text{Hence, } -7/8 [=] 14/-16$$

$$\text{(iv) } -8/5 [] -7/4$$

Solution:-

The LCM of the denominators 5 and 4 is 20

$$\therefore (-8/5) = [(-8 \times 4) / (5 \times 4)] = (-32/20)$$

$$\text{And } (-7/4) = [(-7 \times 5) / (4 \times 5)] = (-35/20)$$

Now,

$$-32 > -35$$

$$\text{So, } (-32/20) > (-35/20)$$

$$\text{Hence, } -8/5 [>] -7/4$$

$$\text{(v) } 1/-3 [] -1/4$$

Solution:-

The LCM of the denominators 3 and 4 is 12

$$\therefore (-1/3) = [(-1 \times 4) / (3 \times 4)] = (-4/12)$$

$$\text{And } (-1/4) = [(-1 \times 3) / (4 \times 3)] = (-3/12)$$

Now,

$$-4 < -3$$

$$\text{So, } (-4/12) < (-3/12)$$

$$\text{Hence, } 1/3 < 1/4$$

$$\text{(vi) } 5/-11 > -5/11$$

Solution:-

$$\text{Since, } (-5/11) = (-5/11)$$

$$\text{Hence, } 5/-11 = -5/11$$

$$\text{(vii) } 0 > -7/6$$

Solution:-

Since every negative rational number is less than 0,

We get:

$$= 0 > -7/6$$

9. Which is greater in each of the following:

$$\text{(i) } 2/3, 5/2$$

Solution:-

The LCM of the denominators 3 and 2 is 6

$$(2/3) = [(2 \times 2) / (3 \times 2)] = (4/6)$$

$$\text{And } (5/2) = [(5 \times 3) / (2 \times 3)] = (15/6)$$

Now,

$$4 < 15$$

$$\text{So, } (4/6) < (15/6)$$

$$\therefore 2/3 < 5/2$$

Hence, $5/2$ is greater.

(ii) $-5/6, -4/3$

Solution:-

The LCM of the denominators 6 and 3 is 6

$$\therefore (-5/6) = [(-5 \times 1) / (6 \times 1)] = (-5/6)$$

$$\text{And } (-4/3) = [(-4 \times 2) / (3 \times 2)] = (-8/6)$$

Now,

$$-5 > -8$$

$$\text{So, } (-5/6) > (-8/6)$$

$$\therefore -5/6 > -4/3$$

Hence, $-5/6$ is greater.

(iii) $-3/4, 2/3$

Solution:-

The LCM of the denominators 4 and 3 is 12

$$\therefore (-3/4) = [(-3 \times 3) / (4 \times 3)] = (-9/12)$$

$$\text{And } (2/3) = [(2 \times 4) / (3 \times 4)] = (8/12)$$

Now,

$$-9 < 8$$

$$\text{So, } (-9/12) < (8/12)$$

$$\therefore -3/4 < 2/-3$$

Hence, 2/-3 is greater.

(iv) $-1/4, 1/4$

Solution:-

The given fraction is like fraction,

$$\text{So, } -1/4 < 1/4$$

Hence $1/4$ is greater,

(v)
 $-3\frac{2}{7},$
 $-3\frac{4}{5}$

Solution:-

First, we have to convert mixed fractions into improper fractions,

$$-3\frac{2}{7} = -23/7$$

$$-3\frac{4}{5} = -19/5$$

Then,

The LCM of the denominators 7 and 5 is 35

$$\therefore (-23/7) = [(-23 \times 5) / (7 \times 5)] = (-115/35)$$

$$\text{And } (-19/5) = [(-19 \times 7) / (5 \times 7)] = (-133/35)$$

Now,

$$-115 > -133$$

$$\text{So, } (-115/35) > (-133/35)$$

$$\therefore$$

$$-3\frac{2}{7} > -3\frac{4}{5}$$

Hence,
 $-3\frac{2}{7}$ is greater.

10. Write the following rational numbers in ascending order:

(i) $-\frac{3}{5}$, $-\frac{2}{5}$, $-\frac{1}{5}$

Solution:-

The given rational numbers are in the form of like fractions,

Hence,

$$(-\frac{3}{5}) < (-\frac{2}{5}) < (-\frac{1}{5})$$

(ii) $-\frac{1}{3}$, $-\frac{2}{9}$, $-\frac{4}{3}$

Solution:-

To convert the given rational numbers into like fractions, we have to find the LCM,

The LCM of 3, 9, and 3 is 9

Now,

$$(-\frac{1}{3}) = [(-1 \times 3) / (3 \times 9)] = (-\frac{3}{9})$$

$$(-\frac{2}{9}) = [(-2 \times 1) / (9 \times 1)] = (-\frac{2}{9})$$

$$(-\frac{4}{3}) = [(-4 \times 3) / (3 \times 3)] = (-\frac{12}{9})$$

Clearly,

$$(-\frac{12}{9}) < (-\frac{3}{9}) < (-\frac{2}{9})$$

Hence,

$$(-\frac{4}{3}) < (-\frac{1}{3}) < (-\frac{2}{9})$$

(iii) $-\frac{3}{7}$, $-\frac{3}{2}$, $-\frac{3}{4}$

Solution:-

To convert the given rational numbers into like fractions, we have to find LCM,

The LCM of 7, 2, and 4 is 28

Now,

$$(-3/7) = [(-3 \times 4) / (7 \times 4)] = (-12/28)$$

$$(-3/2) = [(-3 \times 14) / (2 \times 14)] = (-42/28)$$

$$(-3/4) = [(-3 \times 7) / (4 \times 7)] = (-21/28)$$

Clearly,

$$(-42/28) < (-21/28) < (-12/28)$$

Hence,

$$(-3/2) < (-3/4) < (-3/7)$$

11. Find the sum:

(i) $(5/4) + (-11/4)$

Solution:-

We have:

$$= (5/4) - (11/4)$$

$$= [(5 - 11)/4] \dots [\because \text{denominator is same in both the rational numbers}]$$

$$= (-6/4)$$

$$= -3/2 \dots [\because \text{Divide both numerator and denominator by 2}]$$

(ii) $(5/3) + (3/5)$

Solution:-

Take the LCM of the denominators of the given rational numbers.

The LCM of 3 and 5 is 15

Express each of the given rational numbers with the above LCM as the common denominator.

Now,

$$(5/3) = [(5 \times 5) / (3 \times 5)] = (25/15)$$

$$(3/5) = [(3 \times 3) / (5 \times 3)] = (9/15)$$

Then,

$$= (25/15) + (9/15) \dots [\because \text{denominator is same in both the rational numbers}]$$

$$= (25 + 9)/15$$

$$= 34/15$$

$$\text{(iii) } (-9/10) + (22/15)$$

Solution:-

Take the LCM of the denominators of the given rational numbers.

The LCM of 10 and 15 is 30

Express each of the given rational numbers with the above LCM as the common denominator.

Now,

$$(-9/10) = [(-9 \times 3) / (10 \times 3)] = (-27/30)$$

$$(22/15) = [(22 \times 2) / (15 \times 2)] = (44/30)$$

Then,

$$= (-27/30) + (44/30) \dots [\because \text{denominator is same in both the rational numbers}]$$

$$= (-27 + 44)/30$$

$$= (17/30)$$

$$\text{(iv) } (-3/-11) + (5/9)$$

Solution:-

We have,

$$= 3/11 + 5/9$$

Take the LCM of the denominators of the given rational numbers.

The LCM of 11 and 9 is 99

Express each of the given rational numbers with the above LCM as the common denominator.

Now,

$$(3/11) = [(3 \times 9) / (11 \times 9)] = (27/99)$$

$$(5/9) = [(5 \times 11) / (9 \times 11)] = (55/99)$$

Then,

$$= (27/99) + (55/99) \dots [\because \text{denominator is same in both the rational numbers}]$$

$$= (27 + 55)/99$$

$$= (82/99)$$

$$\textbf{(v) } (-8/19) + (-2/57)$$

Solution:-

We have

$$= -8/19 - 2/57$$

Take the LCM of the denominators of the given rational numbers.

The LCM of 19 and 57 is 57

Express each of the given rational numbers with the above LCM as the common denominator.

Now,

$$(-8/19) = [(-8 \times 3) / (19 \times 3)] = (-24/57)$$

$$(-2/57) = [(-2 \times 1) / (57 \times 1)] = (-2/57)$$

Then,

$$= (-24/57) - (2/57) \dots [\because \text{denominator is same in both the rational numbers}]$$

$$= (-24 - 2)/57$$

$$= (-26/57)$$

$$(vi) -2/3 + 0$$

Solution:-

We know that if any number or fraction is added to zero, the answer will be the same number or fraction.

Hence,

$$= -2/3 + 0$$

$$= -2/3$$

$$(vii) -2\frac{1}{3} + 4\frac{3}{5}$$

Solution:-

First, we have to convert mixed fractions into improper fractions.

$$= -2\frac{1}{3} = -7/3$$

$$= 4\frac{3}{5} = 23/5$$

We have, $-7/3 + 23/5$

Take the LCM of the denominators of the given rational numbers.

The LCM of 3 and 5 is 15

Express each of the given rational numbers with the above LCM as the common denominator.

Now,

$$(-7/3) = [(-7 \times 5) / (3 \times 5)] = (-35/15)$$

$$(23/5) = [(23 \times 3) / (5 \times 3)] = (69/15)$$

Then,

$$= (-35/15) + (69/15) \dots [\because \text{denominator is same in both the rational numbers}]$$

$$= (-35 + 69)/15$$

$$= (34/15)$$

12. Find the value of:

(i) $7/24 - 17/36$

Solution:-

Take the LCM of the denominators of the given rational numbers.

The LCM of 24 and 36 is 72

Express each of the given rational numbers with the above LCM as the common denominator.

Now,

$$(7/24) = [(7 \times 3) / (24 \times 3)] = (21/72)$$

$$(17/36) = [(17 \times 2) / (36 \times 2)] = (34/72)$$

Then,

$$= (21/72) - (34/72) \dots [\because \text{denominator is same in both the rational numbers}]$$

$$= (21 - 34)/72$$

$$= (-13/72)$$

(ii) $5/63 - (-6/21)$

Solution:-

We can also write $-6/21 = -2/7$

$$= 5/63 - (-2/7)$$

We have,

$$= 5/63 + 2/7$$

Take the LCM of the denominators of the given rational numbers.

The LCM of 63 and 7 is 63

Express each of the given rational numbers with the above LCM as the common denominator.

Now,

$$(5/63) = [(5 \times 1) / (63 \times 1)] = (5/63)$$

$$(2/7) = [(2 \times 9) / (7 \times 9)] = (18/63)$$

Then,

$$= (5/63) + (18/63) \dots [\because \text{denominator is same in both the rational numbers}]$$

$$= (5 + 18)/63$$

$$= 23/63$$

$$\text{(iii) } -6/13 - (-7/15)$$

Solution:-

We have,

$$= -6/13 + 7/15$$

The LCM of 13 and 15 is 195

Express each of the given rational numbers with the above LCM as the common denominator.

Now,

$$(-6/13) = [(-6 \times 15) / (13 \times 15)] = (-90/195)$$

$$(7/15) = [(7 \times 13) / (15 \times 13)] = (91/195)$$

Then,

$$= (-90/195) + (91/195) \dots [\because \text{denominator is same in both the rational numbers}]$$

$$= (-90 + 91)/195$$

$$= (1/195)$$

$$\text{(iv) } -3/8 - 7/11$$

Solution:-

Take the LCM of the denominators of the given rational numbers.

The LCM of 8 and 11 is 88

Express each of the given rational numbers with the above LCM as the common denominator.

Now,

$$(-3/8) = [(-3 \times 11) / (8 \times 11)] = (-33/88)$$

$$(7/11) = [(7 \times 8) / (11 \times 8)] = (56/88)$$

Then,

$$= (-33/88) - (56/88) \dots [\because \text{denominator is same in both the rational numbers}]$$

$$= (-33 - 56)/88$$

$$= (-89/88)$$

$$(v) -2\frac{1}{9} - 6$$

Solution:-

First, we have to convert the mixed fraction into an improper fraction,

$$-2\frac{1}{9} = -19/9$$

We have, $-19/9 - 6$

Take the LCM of the denominators of the given rational numbers.

The LCM of 9 and 1 is 9

Express each of the given rational numbers with the above LCM as the common denominator.

Now,

$$(-19/9) = [(-19 \times 1) / (9 \times 1)] = (-19/9)$$

$$(6/1) = [(6 \times 9) / (1 \times 9)] = (54/9)$$

Then,

$$= (-19/9) - (54/9) \dots [\because \text{denominator is same in both the rational numbers}]$$

$$= (-19 - 54)/9$$

$$= (-73/9)$$

13. Find the product:

(i) $(9/2) \times (-7/4)$

Solution:-

The product of two rational numbers = (product of their numerator)/(product of their denominator)

The above question can be written as $(9/2) \times (-7/4)$

We have,

$$= (9 \times -7) / (2 \times 4)$$

$$= -63/8$$

(ii) $(3/10) \times (-9)$

Solution:-

The product of two rational numbers = (product of their numerator)/(product of their denominator)

The above question can be written as $(3/10) \times (-9/1)$

We have,

$$= (3 \times -9) / (10 \times 1)$$

$$= -27/10$$

(iii) $(-6/5) \times (9/11)$

Solution:-

The product of two rational numbers = (product of their numerator)/(product of their denominator)

We have,

$$= (-6 \times 9) / (5 \times 11)$$

$$= -54/55$$

(iv) $(3/7) \times (-2/5)$

Solution:-

The product of two rational numbers = (product of their numerator)/(product of their denominator)

We have,

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

$$= -6/35$$

(v) $(3/11) \times (2/5)$

Solution:-

The product of two rational numbers = (product of their numerator)/(product of their denominator)

We have,

$$= (3 \times 2) / (11 \times 5)$$

$$= 6/55$$

(vi) $(3/-5) \times (-5/3)$

Solution:-

The product of two rational numbers = (product of their numerator)/(product of their denominator)

We have,

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

On simplifying,

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

$$= -1/-1$$

$$= 1$$

14. Find the value of:

(i) $(-4) \div (2/3)$

Solution:-

We have,

$$= (-4/1) \times (3/2) \dots [\because \text{reciprocal of } (2/3) \text{ is } (3/2)]$$

The product of two rational numbers = (product of their numerator)/(product of their denominator)

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

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

$$= -6$$

(ii) $(-3/5) \div 2$

Solution:-

We have,

$$= (-3/5) \times (1/2) \dots [\because \text{reciprocal of } (2/1) \text{ is } (1/2)]$$

The product of two rational numbers = (product of their numerator)/(product of their denominator)

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

$$= -3/10$$

(iii) $(-4/5) \div (-3)$

Solution:-

We have,

$$= (-4/5) \times (1/-3) \dots [\because \text{reciprocal of } (-3) \text{ is } (1/-3)]$$

The product of two rational numbers = (product of their numerator)/(product of their denominator)

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

$$= -4/-15$$

$$= 4/15$$

(iv) $(-1/8) \div 3/4$

Solution:-

We have,

$$= (-1/8) \times (4/3) \dots [\because \text{reciprocal of } (3/4) \text{ is } (4/3)]$$

The product of two rational numbers = (product of their numerator)/(product of their denominator)

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

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

$$= -1/6$$

(v) $(-2/13) \div 1/7$

Solution:-

We have,

$$= (-2/13) \times (7/1) \dots [\because \text{reciprocal of } (1/7) \text{ is } (7/1)]$$

The product of two rational numbers = (product of their numerator)/(product of their denominator)

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

$$= -14/13$$

(vi) $(-7/12) \div (-2/13)$

Solution:-

We have,

$$= (-7/12) \times (13/-2) \dots [\because \text{reciprocal of } (-2/13) \text{ is } (13/-2)]$$

The product of two rational numbers = (product of their numerator)/(product of their denominator)

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

$$= -91/-24$$

$$= 91/24$$

(vii) $(3/13) \div (-4/65)$

Solution:-

We have,

$$= (3/13) \times (65/-4) \dots [\because \text{reciprocal of } (-4/65) \text{ is } (65/-4)]$$

The product of two rational numbers = (product of their numerator)/(product of their denominator)

$$= (3 \times 65) / (13 \times (-4))$$

$$= 195/-52$$

$$= -15/4$$