

Get better at Math.
Get better at
everything.



Come experience the Cuemath methodology and ensure your child stays ahead at math this summer.



**Adaptive
Platform**



**Interactive Visual
Simulations**



**Personalized
Attention**

For Grades 1 - 10



LIVE online classes
by trained and
certified experts.

Get the Cuemath advantage

Book a FREE trial class

Chapter-9: Rational Numbers

Exercise 9.1 (Page 182)

Q1. List five rational numbers between:

(i) -1 and 0 (ii) -2 and -1 (iii) $\frac{-4}{5}$ and $\frac{-2}{3}$ (iv) $-\frac{1}{2}$ and $\frac{2}{3}$

Difficulty Level- Low

What is given /known?

Two integers.

What is the unknown?

Five rational numbers between the given two integers.

Reasoning:

These questions can be solved easily with the concept of like fractions, First make the fractions like by making their denominator equal. You can make denominator equal either by taking L.C.M of denominator or by multiplying both numerator and denominator by same integer. By applying these methods, you can get the like fractions and can easily find out the rational numbers between the given numbers.

Solution:

(i) -1 and 0

Multiplying both numerator and denominator by 6, we get

$$\frac{-1 \times 6}{1 \times 6} = \frac{-6}{6},$$

$$\frac{0 \times 6}{1 \times 6} = \frac{0}{6}$$

Five rational numbers between -1 and 0 are,

$$\frac{-6}{6} < \frac{-5}{6} < \frac{-4}{6} < \frac{-3}{6} < \frac{-2}{6} < \frac{-1}{6} < \frac{0}{6}$$

$$-1 < \frac{-5}{6} < \frac{-4}{6} < \frac{-3}{6} < \frac{-2}{6} < \frac{-1}{6} < 0$$

Thus, the five rational numbers between -1 and 0 are

$$\frac{-5}{6}, \frac{-2}{3}, \frac{-1}{2}, \frac{-1}{3}, \frac{-1}{6}$$

(ii) -2 and -1

Multiplying both numerator and denominator by 6, we get

$$\frac{-2 \times 6}{1 \times 6} = \frac{-12}{6},$$

$$\frac{-1 \times 6}{1 \times 6} = \frac{-6}{6}$$

Five rational numbers between -2 and -1 are,

$$\frac{-12}{6} < \frac{-11}{6} < \frac{-10}{6} < \frac{-9}{6} < \frac{-8}{6} < \frac{-7}{6} < \frac{-6}{6}$$

$$-2 < \frac{-11}{6} < \frac{-10}{6} < \frac{-9}{6} < \frac{-8}{6} < \frac{-7}{6} < -1$$

Thus, the five rational numbers between -2 and -1 are

$$\frac{-11}{6}, \frac{-5}{3}, \frac{-3}{2}, \frac{-4}{3}, \frac{-7}{6}$$

(iii) $\frac{-4}{5}$ and $\frac{-2}{3}$

Converting $\frac{-4}{5}$ and $\frac{-2}{3}$ into like fractions, we get

$$\frac{-4}{5} = \frac{-4 \times 9}{5 \times 9} = \frac{-36}{45}$$

$$\frac{-2}{3} = \frac{-2 \times 15}{3 \times 15} = \frac{-30}{45}$$

Five rational numbers between $\frac{-4}{5}$ and $\frac{-2}{3}$ are,

$$\frac{-36}{45} < \frac{-35}{45} < \frac{-34}{45} < \frac{-33}{45} < \frac{-32}{45} < \frac{-31}{45} < \frac{-30}{45}$$

$$\frac{-4}{5} < \frac{-35}{45} < \frac{-34}{45} < \frac{-33}{45} < \frac{-32}{45} < \frac{-31}{45} < \frac{-2}{3}$$

Therefore, the five rational numbers between $\frac{-4}{5}$ and $\frac{-2}{3}$ are,

$$\frac{-7}{9}, \frac{-34}{45}, \frac{-11}{15}, \frac{-32}{45}, \frac{-31}{45}$$

(iv) $-\frac{1}{2}$ and $\frac{2}{3}$

Converting $-\frac{1}{2}$ and $\frac{2}{3}$ into like fractions, we get

$$\frac{-1}{2} = \frac{-1 \times 3}{2 \times 3} = \frac{-3}{6}$$

$$\frac{2}{3} = \frac{2 \times 2}{3 \times 2} = \frac{4}{6}$$

Five rational numbers between $-\frac{1}{2}$ and $\frac{2}{3}$ are,

$$\frac{-3}{6} < \frac{-2}{6} < \frac{-1}{6} < 0 < \frac{2}{6} < \frac{3}{6} < \frac{4}{6}$$

Therefore, the five rational numbers between $-\frac{1}{2}$ and $\frac{2}{3}$ are,

$$\frac{-1}{3}, \frac{-1}{6}, 0, \frac{1}{3}, \frac{1}{2}$$

Q2. Write four more rational numbers in each of the following patterns:

(i) $\frac{-3}{5}, \frac{-6}{5}, \frac{-9}{15}, \frac{-12}{5}$

(ii) $\frac{-1}{4}, \frac{-2}{8}, \frac{-3}{12}$

(iii) $\frac{-1}{6}, \frac{2}{-12}, \frac{3}{-18}, \frac{4}{-24}$

(iv) $\frac{-2}{3}, \frac{2}{-3}, \frac{4}{-6}, \frac{6}{-9}$

Difficulty Level- Low

What is given /known?

Patterns of the numbers.

What is the unknown?

Four more rational numbers in each of the given patterns.

Reasoning:

This question is based on a definite pattern, while solving such type of questions observe the numerator and denominator carefully. Here both numerator and denominator are following a definite pattern, observe this pattern and follow the same pattern, you can easily find out the next four rational numbers.

Solution:

$$\text{i) } \frac{-3}{5}, \frac{-6}{10}, \frac{-9}{15}, \frac{-12}{20}$$

$$\frac{-3 \times 1}{5 \times 1}, \frac{-3 \times 2}{5 \times 2}, \frac{-3 \times 3}{5 \times 3}, \frac{-3 \times 4}{5 \times 4}, \dots$$

Next four rational numbers in the same pattern,

$$\frac{-3 \times 5}{5 \times 5}, \frac{-3 \times 6}{5 \times 6}, \frac{-3 \times 7}{5 \times 7}, \frac{-3 \times 8}{5 \times 8}$$

Therefore, the numbers are $\frac{-15}{25}, \frac{-18}{30}, \frac{-21}{35}, \frac{-24}{40}$

$$\text{(ii) } \frac{-1}{4}, \frac{-2}{8}, \frac{-3}{12}$$

$$\frac{-1 \times 1}{4 \times 1}, \frac{-1 \times 2}{4 \times 2}, \frac{-1 \times 3}{4 \times 3}, \dots$$

Next four rational numbers in the same pattern,

$$\frac{-1 \times 4}{4 \times 4}, \frac{-1 \times 5}{4 \times 5}, \frac{-1 \times 6}{4 \times 6}, \frac{-1 \times 7}{4 \times 7}$$

Therefore, the numbers are $\frac{-4}{16}, \frac{-5}{20}, \frac{-6}{24}, \frac{-7}{28}$.

$$\text{(iii) } \frac{-1}{6}, \frac{2}{-12}, \frac{3}{-18}, \frac{4}{-24}$$

$$\frac{1 \times 1}{-6 \times 1}, \frac{1 \times 2}{-6 \times 2}, \frac{1 \times 3}{-6 \times 3}, \frac{1 \times 4}{-6 \times 4}, \dots$$

Next four rational numbers in the same pattern,

$$\frac{1 \times 5}{-6 \times 5}, \frac{1 \times 6}{-6 \times 6}, \frac{1 \times 7}{-6 \times 7}, \frac{1 \times 8}{-6 \times 8}$$

Therefore, the numbers are $\frac{5}{-30}, \frac{6}{-36}, \frac{7}{-42}, \frac{8}{-48}$.

$$(iv) \quad \frac{-2}{3}, \frac{2}{-3}, \frac{4}{-6}, \frac{6}{-9}$$

$$\frac{-2 \times 1}{3 \times 1}, \frac{2 \times 1}{-3 \times 1}, \frac{2 \times 2}{-3 \times 2}, \frac{2 \times 3}{-3 \times 3} \dots$$

Next four rational numbers in the same pattern,

$$\frac{2 \times 4}{-3 \times 4}, \frac{2 \times 5}{-3 \times 5}, \frac{2 \times 6}{-3 \times 6}, \frac{2 \times 7}{-3 \times 7}$$

Therefore, the numbers are $\frac{8}{-12}, \frac{10}{-15}, \frac{12}{-18}, \frac{14}{-21}$

Q3. Give four rational numbers equivalent to:

$$(i) \frac{-2}{7} \quad (ii) \frac{5}{-3} \quad (iii) \frac{4}{9}$$

Difficulty Level- Low

What is given /known?

Three rational numbers.

What is the unknown?

Four rational numbers equivalent to each of the given rational number.

Reasoning:

To find out the equivalent fraction of any rational number, multiply the numerator and the denominator of the given number by the same numbers. Remember here it is asked for four equivalent rational numbers that means you have to multiply four different numbers, one by one in both numerator and denominator of the given number.

Solution:

$$(i) \frac{-2}{7}$$

Multiplying both numerator and denominator with the same number, we get

$$\frac{-2 \times 2}{7 \times 2} = \frac{-4}{14}, \quad \frac{-2 \times 3}{7 \times 3} = \frac{-6}{21}, \quad \frac{-2 \times 4}{7 \times 4} = \frac{-8}{28}, \quad \frac{-2 \times 5}{7 \times 5} = \frac{-10}{35}$$

Therefore, the equivalent fractions to the number $\frac{-2}{7}$ are,

$$\frac{-4}{14}, \frac{-6}{21}, \frac{-8}{28}, \frac{-10}{35}$$

(ii) $\frac{5}{-3}$

Multiplying both numerator and denominator with the same number, we get

$$\frac{5 \times 2}{-3 \times 2} = \frac{10}{-6}, \quad \frac{5 \times 3}{-3 \times 3} = \frac{15}{-9}, \quad \frac{5 \times 4}{-3 \times 4} = \frac{20}{-12}, \quad \frac{5 \times 5}{-3 \times 5} = \frac{25}{-15}$$

Therefore, the equivalent fractions to the number $\frac{5}{-3}$ are,

$$\frac{10}{-6}, \quad \frac{15}{-9}, \quad \frac{20}{-12}, \quad \frac{25}{-15}$$

(iii) $\frac{4}{9}$

Multiplying both numerator and denominator with the same number, we get

$$\frac{4 \times 2}{9 \times 2} = \frac{8}{18}, \quad \frac{4 \times 3}{9 \times 3} = \frac{12}{27}, \quad \frac{4 \times 4}{9 \times 4} = \frac{16}{36}, \quad \frac{4 \times 5}{9 \times 5} = \frac{20}{45}$$

Therefore, the equivalent fractions to the number $\frac{4}{9}$ are,

$$\frac{8}{18}, \quad \frac{12}{27}, \quad \frac{16}{36} \text{ and } \frac{20}{45}$$

Q4. Draw the number line and represent the following rational numbers on it:

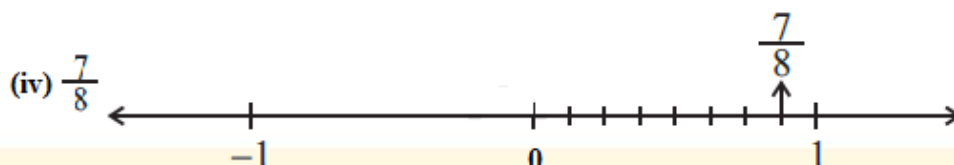
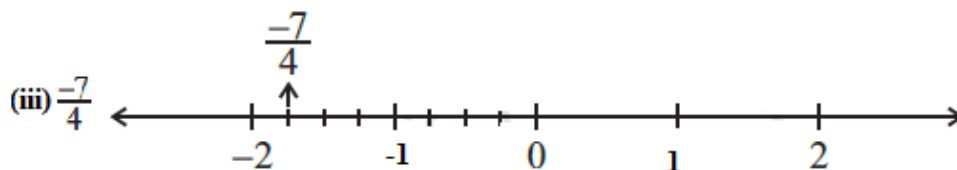
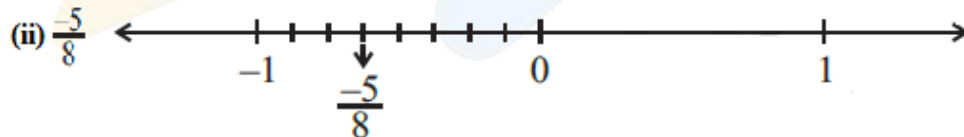
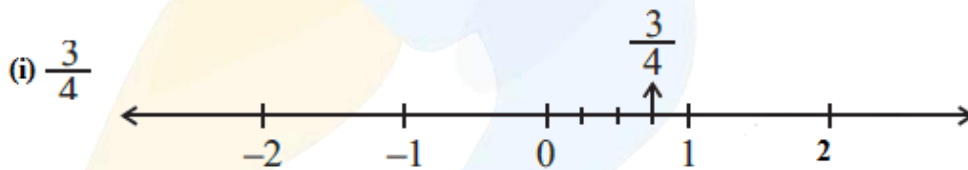
(i) $\frac{3}{4}$

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

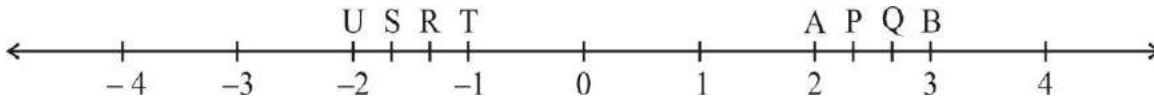
(iii) $\frac{-7}{4}$

(iv) $\frac{7}{8}$

Solution:



Q5. 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:

Distance between U and T = 1 unit. It is divided into three equal parts.

$$TR = RS = SU = \frac{1}{3}$$

$$R = -1 - \frac{1}{3} = \frac{-4}{3}$$

$$S = -1 - \frac{2}{3} = \frac{-5}{3}$$

Similarly, $AB = 1$ unit

It is divided into three equal parts.

$$AP = PQ = QB = \frac{1}{3}$$

$$P = 2 + \frac{1}{3} = \frac{6}{3} + \frac{1}{3} = \frac{7}{3}$$

$$Q = 2 + \frac{2}{3} = \frac{6}{3} + \frac{2}{3} = \frac{8}{3}$$

Thus, the rational number P, Q, R and S are $\frac{7}{3}$, $\frac{8}{3}$, $\frac{-4}{3}$ and $\frac{-5}{3}$.

Q 6. Which of the following pairs represent the same rational number?

(i) $\frac{-7}{21}$ and $\frac{3}{9}$ (ii) $\frac{-16}{20}$ and $\frac{20}{-25}$ (iii) $\frac{-2}{-3}$ and $\frac{2}{3}$ (iv) $\frac{-3}{5}$ and $\frac{-12}{20}$

(v) $\frac{8}{-5}$ and $\frac{-24}{15}$ (vi) $\frac{1}{3}$ and $\frac{-1}{9}$ (vii) $\frac{-5}{-9}$ and $\frac{5}{-9}$

Difficulty Level - Medium

What is given /known?

Two pair of rational numbers.

What is the unknown?

Which pair represent the same rational number.

Reasoning:

In such type of questions, reduce the rational numbers to the lowest or simplest form. By reducing them to the simplest form you can easily get out the same rational numbers.

Solution:

(i) $\frac{-7}{21}$ and $\frac{3}{9}$

On reducing them to the simplest form, we get

$$\frac{-7}{21} = \frac{-1}{3} \text{ and } \frac{3}{9} = \frac{1}{3}$$

Since, $\frac{-1}{3} \neq \frac{1}{3}$

Therefore, $\frac{-7}{21}$ and $\frac{3}{9}$ does not represent the pair of same rational numbers.

(ii) $\frac{-16}{20}$ and $\frac{20}{-25}$

On reducing them to the simplest form, we get

$$\frac{-16}{20} = \frac{-4}{5} \text{ and } \frac{20}{-25} = \frac{4}{-5}$$

since, $\frac{-4}{5} = \frac{4}{-5}$

Therefore, $\frac{-16}{20}$ and $\frac{20}{-25}$ represents the pair of same rational numbers.

(iii) $\frac{-2}{-3}$ and $\frac{2}{3}$

On reducing them to the simplest form, we get

$$\frac{-2}{-3} = \frac{2}{3} \text{ and } \frac{2}{3} = \frac{2}{3}$$

since, $\frac{-2}{-3} = \frac{2}{3}$

Therefore, $\frac{-2}{-3}$ and $\frac{2}{3}$ represents the pair of same rational numbers.

(iv) $\frac{-3}{5}$ and $\frac{-12}{20}$

On reducing them to the simplest form, we get

$$\frac{-3}{5} = \frac{-3}{5} \quad \text{and} \quad \frac{-12}{20} = \frac{-3}{5}$$

since, $\frac{-3}{5} = \frac{-3}{5}$

Therefore, $\frac{-3}{5}$ and $\frac{-12}{20}$ represent the pair of same rational numbers.

(v) $\frac{8}{-5}$ and $\frac{-24}{15}$

On reducing them to the simplest form, we get

$$\frac{8}{-5} = \frac{8}{-5} \quad \text{and} \quad \frac{-24}{15} = \frac{-8}{5}$$

Since, $\frac{8}{-5} = \frac{-8}{5}$

Therefore, $\frac{8}{-5}$ and $\frac{-24}{15}$ represent the pair of same rational numbers.

(vi) $\frac{1}{3}$ and $\frac{-1}{9}$

On reducing them to the simplest form, we get

$$\frac{1}{3} = \frac{1}{3} \quad \text{and} \quad \frac{-1}{9} = \frac{-1}{9}$$

Since, $\frac{1}{3} \neq \frac{-1}{9}$

Therefore, $\frac{1}{3}$ and $\frac{-1}{9}$ do not represent the pair of same rational numbers.

(vii) $\frac{-5}{-9}$ and $\frac{5}{-9}$

On reducing them to the simplest form, we get

$$\frac{-5}{-9} = \frac{5}{9} \quad \text{and} \quad \frac{5}{-9} = \frac{-5}{9}$$

Since, $\frac{5}{9} \neq \frac{-5}{9}$

Therefore, $\frac{-5}{-9}$ and $\frac{5}{-9}$ do not represent the pair of same rational numbers.

Q7. Rewrite the following rational numbers in the simplest form:

(i) $\frac{-8}{6}$

(ii) $\frac{25}{45}$

(iii) $\frac{-44}{72}$

(iv) $\frac{-8}{10}$

Difficulty Level- Low

What is given /known?

Rational numbers.

What is the unknown?

Simplest form of the given rational numbers.

Reasoning:

While solving such type of questions, find the H.C.F of numerator and denominator and then divide both numerator and denominator by the H.C.F. After dividing it you will get the simplest form of the rational number.

Solution:

(i) $\frac{-8}{6}$

H.C.F. of 8 and 6 is two. Dividing the numerator and denominator by H.C.F., we get

$$\frac{-8 \div 2}{6 \div 2} = \frac{-4}{3}$$

(ii) $\frac{25}{45}$

H.C.F of 25 and 45 is 5. Dividing the numerator and denominator by H.C.F., we get,

$$\frac{25 \div 5}{45 \div 5} = \frac{5}{9}$$

(iii) $\frac{-44}{72}$

H.C.F of 44 and 72 is 4. Dividing the numerator and denominator by H.C.F., we get,

$$\frac{-44 \div 4}{72 \div 4} = \frac{-11}{18}$$

(iv) $\frac{-8}{10}$

H.C.F of 8 and 10 is 2. Dividing the numerator and denominator by H.C.F., we get,

$$\frac{-8 \div 2}{10 \div 2} = \frac{-4}{5}$$

Q8. Fill in the boxes with the correct symbol out of $>$, $<$, and $=$.

(i) $\frac{-5}{7}$ $\frac{2}{3}$ (ii) $\frac{-4}{5}$ $\frac{-5}{7}$ (iii) $\frac{-7}{8}$

(iv) $\frac{-8}{5}$ $\frac{-7}{4}$ (v) $\frac{1}{-3}$ $\frac{-1}{4}$ (vi) $\frac{5}{-11}$ $\frac{-5}{11}$

(vi) 0 $\frac{-7}{6}$

Difficulty Level- Medium

What is given /known?

Two rational numbers.

What is the unknown?

Comparison of the two rational numbers i.e., which one is smaller and which one is greater or are they both equal.

Reasoning:

In this type of questions, first find the LCM of the denominators of both the rational numbers. Then make denominator of each rational number equal to LCM by multiplying numerator and denominator with the same number (convert them into like fractions). Then comparison of the two numbers can be easily made.

Solution:

(i) $\frac{-5}{7}$ $\frac{2}{3}$

$$\frac{-5 \times 3}{7 \times 3} \quad \square \quad \frac{2 \times 7}{3 \times 7}$$

$$\frac{-15}{21} \quad \square \quad \frac{14}{21}$$

$$\frac{-15}{21} \quad \square \quad \frac{14}{21}$$

(Positive number is greater than the negative number)

Therefore, $\frac{-5}{7} < \frac{2}{3}$

$$(ii) \quad \frac{-4}{5} \quad \square \quad \frac{-5}{7}$$

$$\frac{-4 \times 7}{5 \times 7} \quad \square \quad \frac{-5 \times 5}{7 \times 5}$$

$$\frac{-28}{35} \quad \square \quad \frac{-25}{35}$$

$$\frac{-28}{35} \quad \squareleftarrow \quad \frac{-25}{35}$$

Therefore, $\frac{-4}{5} < \frac{-5}{7}$

$$(iii) \quad \frac{-7}{8} \quad \square \quad \frac{14}{-16}$$

$$\frac{-7 \times 2}{8 \times 2} \quad \square \quad \frac{14 \times 1}{-16 \times 1}$$

$$\frac{-14}{16} \quad \square \quad \frac{14}{-16}$$

$$\frac{-14}{16} \quad \square \quad \frac{-14}{16}$$

Therefore, $\frac{-7}{8} = \frac{14}{-16}$

$$(iv) \quad \frac{-8}{5} \quad \square \quad \frac{-7}{4}$$

$$\frac{-8 \times 4}{5 \times 4} \quad \square \quad \frac{-7 \times 5}{4 \times 5}$$

$$\frac{-32}{20} \quad \square \quad \frac{-35}{20}$$

$$\frac{-8}{5} \quad \square \rightarrow \quad \frac{-7}{4}$$

Therefore, $\frac{-8}{5} > \frac{-7}{4}$

$$(v) \frac{1}{-3} \square \frac{-1}{4}$$

$$\frac{1 \times 4}{-3 \times 4} \square \frac{-1 \times -3}{4 \times -3}$$

$$\frac{4}{-12} \square \frac{3}{-12}$$

$$\frac{1}{-3} \square \frac{-1}{4}$$

Therefore, $\frac{1}{-3} > \frac{-1}{4}$

$$(vi) \frac{5}{-11} \square \frac{-5}{11}$$

$$\frac{-5}{11} \square \frac{-5}{11}$$

$$\frac{-5}{11} \equiv \frac{-5}{11}$$

Therefore, $\frac{5}{-11} = \frac{-5}{11}$

$$(vii) 0 \square \frac{-7}{6}$$

$$0 \square \frac{-7}{6}$$

$$0 \square \frac{-7}{6} \quad (0 \text{ is always greater than negative integer})$$

Q9. Which is greater in each of the following:

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

$$(ii) \frac{-5}{6}, \frac{-4}{3}$$

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

$$(iv) \frac{-1}{4}, \frac{1}{4}$$

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

Difficulty Level - Medium

What is given /known?

Two rational numbers.

What is the unknown?

Greater rational number of the two given rational numbers.

Reasoning:

In such type of questions take the L.C.M of denominator of both the rational numbers or convert them into like fractions. After converting them into like fractions comparison will be easy.

Solution:

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

L.C.M of 3 and 2 is 6

$$\frac{2 \times 2}{3 \times 2} = \frac{4}{6} \quad \text{and} \quad \frac{5 \times 3}{2 \times 3} = \frac{15}{6}$$

$$\text{Since, } \frac{4}{6} < \frac{15}{6} \quad \text{so, } \frac{2}{3} < \frac{5}{2}$$

(ii) $\frac{-5}{6}, \frac{-4}{3}$

L.C.M of 6 and 3 is 6

$$\frac{-5 \times 1}{6 \times 1} = \frac{-5}{6} \quad \text{and} \quad \frac{-4 \times 2}{3 \times 2} = \frac{-8}{6}$$

$$\text{Since, } \frac{-5}{6} > \frac{-8}{6} \quad \text{So, } \frac{-5}{6} > \frac{-4}{3}$$

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

L.C.M of 4 and 3 is 12

$$\frac{-3}{4} = \frac{-3 \times 3}{4 \times 3} = \frac{-9}{12} \quad \text{and} \quad \frac{2}{-3} = \frac{2 \times 4}{-3 \times 4} = \frac{-8}{12}$$

$$\text{Since, } \frac{-9}{12} < \frac{-8}{12} \quad \text{So, } \frac{-3}{4} < \frac{2}{-3}$$

(iv) $\frac{-1}{4}, \frac{1}{4}$

$$\frac{-1}{4} < \frac{1}{4}$$

(Negative number is always smaller than the positive number)

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

$$-3\frac{2}{7} = \frac{-23}{7} \quad \text{and} \quad -3\frac{4}{5} = \frac{-19}{5}$$

L.C.M of 7 and 5 is 35

$$\frac{-23}{7} = \frac{-23 \times 5}{7 \times 5} = \frac{-115}{35}$$

$$\frac{-19}{5} = \frac{-19 \times 7}{5 \times 7} = \frac{-133}{35}$$

$$\text{Since, } \frac{-115}{35} > \frac{-133}{35}$$

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

Q10. Write the following rational numbers in ascending order:

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

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

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

Difficulty Level - Low

What is given /known?

Three rational numbers.

What is the unknown?

Ascending order of the given rational numbers.

Reasoning:

In such type of questions take the L.C.M of denominator of the rational numbers or convert them into like fractions. After converting them into like fractions comparison will be easy.

Solution:

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

Since denominator is same in all the rational numbers, these can be easily arranged into ascending order ,

$$-3 < -2 < -1$$

Hence, the required ascending order is,

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

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

L.C.M of 3,9 and 3 is 9

$$\text{So, } \frac{-1}{3} = \frac{-1 \times 3}{3 \times 3} = \frac{-3}{9}$$

$$\frac{-2}{9} = \frac{-2 \times 1}{9 \times 1} = \frac{-2}{9}$$

$$\text{and } \frac{-4}{3} = \frac{-4 \times 3}{3 \times 3} = \frac{-12}{9}$$

Arranging them into ascending order we get,

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

$$\text{Or } \frac{-4}{3} < \frac{-1}{3} < \frac{-2}{9}$$

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

L.C.M of 7, 2 and 4 is 28

$$\frac{-3}{7} = \frac{-3 \times 4}{7 \times 4} = \frac{-12}{28}$$

$$\frac{-3}{2} = \frac{-3 \times 14}{2 \times 14} = \frac{-42}{28}$$

$$\frac{-3}{4} = \frac{-3 \times 7}{4 \times 7} = \frac{-21}{28}$$

Arranging them into ascending order we get,

$$\frac{-42}{28} < \frac{-21}{28} < \frac{-12}{28}$$

$$\text{Therefore, } \frac{-3}{2} < \frac{-3}{4} < \frac{-3}{7}$$

Chapter-9: Rational Numbers

Exercise 9.2 (Page 190)

Q1. Find the sum:

$$(i) \frac{5}{4} + \left[\frac{-11}{4} \right]$$

$$(ii) \frac{5}{3} + \frac{3}{5}$$

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

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

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

$$(vi) \frac{-2}{3} + 0$$

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

Difficulty Level: Low

What is given /known?

Two rational numbers

What is the unknown?

Sum of two rational numbers.

Reasoning:

In such type of questions, take the L.C.M of denominator or convert the given fractions into like fractions and then find their sum. You can also reduce the fractions to the lowest form.

Solution:

$$(i) \frac{5}{4} + \left[\frac{-11}{4} \right] = \frac{5}{4} - \frac{11}{4} = \frac{5-11}{4} = \frac{-6}{4} = \frac{-3}{2}$$

$$(ii) \frac{5}{3} + \frac{3}{5}$$

Taking L.C.M of 3 and 5, we get 15

$$\frac{5}{3} + \frac{3}{5} = \frac{5 \times 5}{3 \times 5} + \frac{3 \times 3}{5 \times 3} = \frac{25}{15} + \frac{9}{15} = \frac{25+9}{15} = \frac{34}{15}$$

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

Taking L.C.M of 10 and 15, we get 30

$$\frac{-9}{10} + \frac{22}{15} = \frac{-9 \times 3}{10 \times 3} + \frac{22 \times 2}{15 \times 2} = \frac{-27}{30} + \frac{44}{30} = \frac{17}{30}$$

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

Taking L.C.M of 11 and 9, we get 99

$$\frac{-3}{-11} + \frac{5}{9} = \frac{-3 \times 9}{-11 \times 9} + \frac{5 \times 11}{11 \times 9} = \frac{27}{99} + \frac{55}{99} = \frac{82}{99}$$

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

Taking L.C.M of 19 and 57, we get 57

$$\frac{-8}{19} + \frac{(-2)}{57} = \frac{-8 \times 3}{19 \times 3} + \frac{-2 \times 1}{57 \times 1} = \frac{-24}{57} + \frac{-2}{57} = \frac{-24 - 2}{57} = \frac{-26}{57}$$

$$(vi) \frac{-2}{3} + 0$$

Taking L.C.M of 3 and 1, we get 3

$$\frac{-2}{3} + 0 = \frac{-2 \times 1}{3 \times 1} + \frac{0 \times 3}{1 \times 1} = \frac{-2}{3} + \frac{0}{3} = \frac{-2 + 0}{3} = \frac{-2}{3}$$

$$(vii) -2\frac{1}{3} + 4\frac{3}{5} = \frac{-7}{3} + \frac{23}{5}$$

Taking L.C.M of 3 and 5, we get 15

$$\frac{-7 \times 5}{3 \times 5} + \frac{23 \times 3}{5 \times 3} = \frac{-35}{15} + \frac{69}{15} = \frac{-35 + 69}{15} = \frac{34}{15}$$

Q2. Find

$$(i) \frac{7}{24} - \frac{17}{36}$$

$$(ii) \frac{5}{63} - \left[\frac{-6}{21} \right]$$

$$(iii) \frac{-6}{13} - \left[\frac{-7}{15} \right]$$

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

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

Difficulty Level - Low

What is given /known?

Two rational numbers

What is the unknown?

Difference between the given two rational numbers.

Reasoning:

In such type of questions take the L.C.M of denominator or convert them into like fractions, then find their difference between them. You can also reduce them to the lowest or simplest form.

Solution:

(i) $\frac{7}{24} - \frac{17}{36}$

Taking L.C.M of 24 and 36, we get 72

$$\frac{7}{24} - \frac{17}{36} = \frac{7 \times 3}{24 \times 3} - \frac{17 \times 2}{36 \times 2} = \frac{21}{72} - \frac{34}{72} = \frac{21 - 34}{72} = \frac{-13}{72}$$

(ii) $\frac{5}{63} - \left[\frac{-6}{21} \right]$

Taking L.C.M of 63 and 21, we get 63

$$\frac{5}{63} - \left(\frac{-6}{21} \right) = \frac{5 \times 1}{63 \times 1} + \frac{6 \times 3}{21 \times 3} = \frac{5}{63} + \frac{18}{63} = \frac{5 + 18}{63} = \frac{23}{63}$$

(iii) $\frac{-6}{13} - \left[\frac{-7}{15} \right]$

Taking L.C.M of 13 and 15, we get 195

$$\frac{-6}{13} - \frac{-7}{15} = \frac{-6 \times 15}{13 \times 15} + \frac{7 \times 13}{15 \times 13} = \frac{-90}{195} + \frac{91}{195} = \frac{-90 + 91}{195} = \frac{1}{195}$$

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

Taking L.C.M of 8 and 11, we get 88

$$\frac{-3}{8} - \frac{7}{11} = \frac{-3 \times 11}{8 \times 11} - \frac{7 \times 8}{11 \times 8} = \frac{-33}{88} - \frac{56}{88} = \frac{-33 - 56}{88} = \frac{-89}{88}$$

(v) $-2\frac{1}{9} - 6 = -2\frac{1}{9} - \frac{6}{1} = -\frac{19}{9} - \frac{6}{1}$

Taking L.C.M of 9 and 1, we get 9

$$-\frac{19}{9} - \frac{6}{1} = \frac{-19 \times 1}{9 \times 1} - \frac{6 \times 9}{1 \times 9} = \frac{-19}{9} - \frac{54}{9} = \frac{-19 - 54}{9} = \frac{-73}{9}$$

Q3. Find the product:

$$(i) \frac{9}{2} \times \left[\frac{-7}{4} \right]$$

$$(ii) \frac{3}{10} \times (-9)$$

$$(iii) \frac{-6}{5} \times \frac{9}{11}$$

$$(iv) \frac{3}{7} \times \left[\frac{-2}{5} \right]$$

$$(v) \frac{3}{11} \times \frac{2}{5}$$

$$(vi) \frac{3}{-5} \times \frac{-5}{3}$$

Difficulty Level: Low

What is given /known?

Two rational numbers

What is the unknown?

Product of two rational numbers.

Reasoning:

In such type of questions, find the product of numerator and denominator .

Solution:

$$(i) \frac{9}{2} \times \left[\frac{-7}{4} \right] = \frac{9}{2} \times \left[\frac{-7}{4} \right] = \frac{9 \times -7}{2 \times 4} = \frac{-63}{8}$$

$$(ii) \frac{3}{10} \times (-9) = \frac{3}{10} \times \left(\frac{-9}{1} \right) = \frac{3 \times -9}{10 \times 1} = \frac{-27}{10}$$

$$(iii) \frac{-6}{5} \times \frac{9}{11} = \frac{-6 \times 9}{5 \times 11} = \frac{-54}{55}$$

$$(iv) \frac{3}{7} \times \left[\frac{-2}{5} \right] = \frac{3 \times -2}{7 \times 5} = \frac{-6}{35}$$

$$(v) \frac{3}{11} \times \frac{2}{5} = \frac{3 \times 2}{11 \times 5} = \frac{6}{55}$$

$$(vi) \frac{3}{-5} \times \frac{-5}{3} = \frac{3 \times -5}{-5 \times 3} = \frac{-15}{-15} = 1$$

Q4. Find the value of:

$$(i) (-4) \div \frac{2}{3}$$

$$(ii) \frac{-3}{5} \div 2$$

$$(iii) \frac{-4}{5} \div (-3)$$

$$(iv) \frac{-1}{8} \div \frac{3}{4}$$

$$(v) \frac{-2}{13} \div \frac{1}{7}$$

$$(vi) \frac{-7}{12} \div \left[\frac{-2}{13} \right]$$

$$(vii) \frac{3}{13} \div \left[\frac{-4}{65} \right]$$

Difficulty Level: Moderate

What is given /known?

Two numbers.

What is the unknown?

Value of given numbers.

Reasoning:

In such type of questions, convert the denominator into its reciprocal. When you convert the denominator into its reciprocal, the sign of division will also convert into multiplication and now you can find out the product of the given numbers.

Solution:

$$(i) (-4) \div \frac{2}{3} = -4 \times \frac{3}{2} = -2 \times 3 = -6$$

$$(ii) \frac{-3}{5} \div 2 = \frac{-3}{5} \times \frac{1}{2} = \frac{-3}{10}$$

$$(iii) \frac{-4}{5} \div (-3) = \frac{-4}{5} \times \frac{-1}{3} = \frac{4}{15}$$

$$(iv) \frac{-1}{8} \div \frac{3}{4} = \frac{-1}{8} \times \frac{4}{3} = \frac{-4}{24} = \frac{-1}{6}$$

$$(v) \frac{-2}{13} \div \frac{1}{7} = \frac{-2}{13} \times \frac{7}{1} = \frac{-2 \times 7}{13} = \frac{-14}{13}$$

$$(vi) \frac{-7}{12} \div \left[\frac{-2}{13} \right] = \frac{-7}{12} \times \frac{13}{-2} = \frac{-7 \times 13}{12 \times -2} = \frac{-91}{-24} = \frac{91}{24}$$

$$(vii) \frac{3}{13} \div \left[\frac{-4}{65} \right] = \frac{3}{13} \times \frac{65}{-4} = \frac{3 \times 65}{13 \times -4} = \frac{3 \times 5}{-4} = \frac{-15}{4}$$

**When you learn math
in an interesting way,
you never forget.**



25 Million

Math classes &
counting

100K+

Students learning
Math the right way

20+ Countries

Present across USA, UK,
Singapore, India, UAE & more.

Why choose Cuemath?

"Cuemath is a valuable addition to our family. We love solving puzzle cards. My daughter is now visualizing maths and solving problems effectively!"

- Gary Schwartz

"Cuemath is great because my son has a one-on-one interaction with the teacher. The instructor has developed his confidence and I can see progress in his work. One-on-one interaction is perfect and a great bonus."

- Kirk Riley

"I appreciate the effort that miss Nitya puts in to help my daughter understand the best methods and to explain why she got a problem incorrect. She is extremely patient and generous with Miranda."

- Barbara Cabrera

Get the Cuemath advantage

Book a FREE trial class