ODM EDUCATIONAL GROUP
Changing your Tomorrow

Period 4

Addition and Subtraction of Rational numbers

SUBJECT : MATHEMATICS
CHAPTER NUMBER: 02
CHAPTER NAME : RATIONAL NUMBERS

Website: www.odmegroup.org
Email: info@odmps.org
Toll Free: **1800 120 2316**
Sishu Vihar, Infocity Road, Patia, Bhubaneswar- 751024

Learning outcomes

Students will be able to add and subtract rational numbers

ODM EDUCATIONAL GROUP
Changing your Tomorrow

Video on Addition and Subtraction of Rational numbers

https://www.youtube.com/watch?v=y0ISIVabPoA (7:47 seconds)

Addition and Subtraction of Rational numbers

Case 1 : When denominators are equal

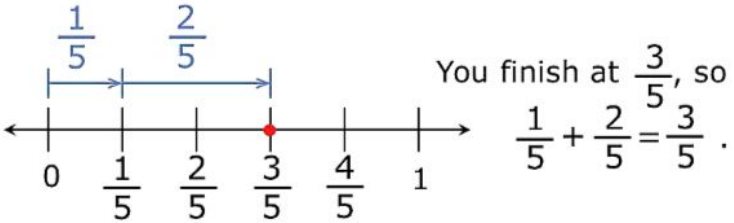
Addition of two rational numbers with the same denominator

i. We can add it using a **number line**.

ii. On the number line we have to move right from 0 to 1/5 units and then move 2/5 units more to the right.

iii. Example:

Add 1/5 and 2/5



You finish at $\frac{3}{5}$, so

$\frac{1}{5} + \frac{2}{5} = \frac{3}{5}$.

ii. If we have to **add two rational numbers** whose denominators are same then we simply add their numerators and the denominator remains the same.

Example

$$\frac{3}{11}+\frac{7}{11}=\frac{3+7}{11}=\frac{10}{11}$$

Solution
As the denominator is the same, we can simply add their numerator.

Addition of two Rational Numbers with different denominator

If we have to add two rational numbers with different denominators then we have to take the LCM of denominators and find their equivalent rational numbers with the LCM as the denominator, and then add them.

Example
Add 2/5 and 3/7.

Solution
To add the two rational numbers, first, we need to take the LCM of denominators the find the equivalent rational numbers.
LCM of 5 and 7 is 35.

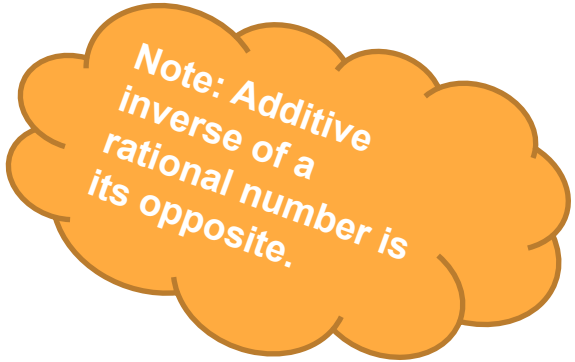
$$\frac{2}{5} \times \frac{7}{7} = \frac{14}{35}$$

$$\frac{3}{7} \times \frac{5}{5} = \frac{15}{35}$$

$$\frac{14}{35} + \frac{15}{35} = \frac{29}{35}$$

Subtraction of two Rational Numbers with different denominator

If we have to subtract two rational numbers with different denominators then we have to take the LCM of denominators and find their equivalent rational numbers with the LCM as the denominator, and then subtract them.



1. Add:

(i) 7/5 and 2/5
(ii) -4/9 and 2/9
(iii) 5/-12 and 1/12

Solution:

(i) 7/5 and 2/5
= 7/5 + 2/5
= (7 + 2)/ 5
= 9/5
= 1 4/5

(ii) -4/9 and 2/9
= -4/9 + 2/9
= (-4 + 2)/ 9
= -2/9

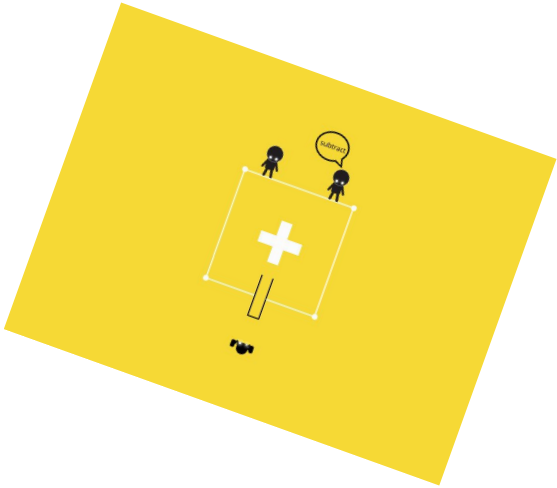
(iii) 5/-12 and 1/12
= -5/12 + 1/12
= (-5 + 1)/ 12
= -4/ 12
= -1/3

(iv) 4/-15 and -7/-15
= – 4/15 + 7/15
= (-4 + 7)/ 15
= 3/15
= 1/5

(v) -7/25 and 9/-25
= -7/25 + -9/25
= [(-7) + (-9)]/ 25
= -16/25

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

= – 7/26 + -7/26
= [(-7) + (-7)]/ 26
= – 14/26
= -7/13



3. Evaluate:

(i) -2/5 + 3/5 + -1/5

(ii) -8/9 + 4/9 + -2/9

(iii) 5/-24 + -1/8 + 3/16

Solution:

(i) -2/5 + 3/5 + -1/5

= (-2 + 3 – 1)/ 5

= 0/5

= 0

(ii) -8/9 + 4/9 + -2/9

= (-8 + 4 – 2)/ 9

= (-10 + 4)/ 9

= -6/9

= -2/3

(iii) 5/-24 + -1/8 + 3/16

= -5/24 + -1/8 + 3/16

LCM of 8, 16 and 24 is 48

= (-5 × 2)/ (24 × 2) + (-1 × 6)/ (8 × 6) + (3 × 3)/ (16 × 3)

= -10/ 48 + -6/48 + 9/48

= (-10 – 6 + 9)/ 48

= (-16 + 9)/ 48

= -7/48

5. Subtract:
(iii) -2/15 from -8/15
(iv) 11/18 from -5/18
(v) -4/11 from -2

(iii) -2/15 from -8/15
= -8/15 – (-2/15)
= -8/15 + 2/15
= (-8 + 2)/ 15
= -6/ 15
= -2/5

(iv) 11/18 from -5/18
= -5/18 – 11/18
= (-5 – 11)/ 18
= -16/18
= -8/9

(v) -4/11 from -2
= -2/1 – (-4/11)
LCM of 1 and 11 is 11
= (- 2 × 11)/ (1 × 11) + (4 × 1)/ (11 × 1)
= -22/11 + 4/11
= (-22 + 4)/ 11
= -18/11

H.W

Exercise 2C Q.No. 2 & 4

AHA

1.Find a rational number which is $\frac{23}{72}$ more than $\frac{-11}{24}$

2.In a basket of fruits, ¼ are apples,1/5areoranges, and 1/3 are bananas, the remaining are pears . What part of basket of fruits are pears?

ODM EDUCATIONAL GROUP

Changing your Tomorrow

THANKING YOU

ODM EDUCATIONAL GROUP

ODM EDUCATIONAL GROUP
Changing your Tomorrow