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Period 6

Multiplication 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

- multiply rational numbers

- Implement its use in real life situations
  like taxes ,banks greatly for calculation of interest and loan ,
  share a pizza or anything,
  specifying home work half portion ; you say that you completed 50 %, i.e 1/2

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Multiplication of a Rational Number with a Positive Integer.

To multiply a rational number with a positive integer we simply multiply the integer with the numerator and the denominator remains the same.

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

Multiply of a Rational Number with a Negative Integer

To multiply a rational number with a negative integer we simply multiply the integer with the numerator and the denominator remains the same and the resultant rational number will be a negative rational number.

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

Multiply of a Rational Number with another Rational Number

To multiply a rational number with another rational number we have to multiply the numerator of two rational numbers and multiply the denominator of the two rational numbers.

$$\text{The Product of Two Rational Numbers} = \frac{\text{Product of Numerators}}{\text{Product of Denominators}}$$

$$\frac{3}{7} \times \frac{5}{11} = \frac{3 \times 5}{7 \times 11} = \frac{15}{77}$$

Prefer writing each rational number in the standard form before multiplying.

EX1D

1. Evaluate:

(i) 5/4 × 3/7

(ii) 2/3 × -6/7

Solution:

(i) 5/4 × 3/7

It can be written as

= (5 × 3)/ (4 × 7)

= 15/28

(ii) 2/3 × -6/7

It can be written as

= (2 × -6)/ (3 × 7)

By further calculation

= (2 × -2)/ 7

= -4/7

2. Multiply:

(vi) 2 1/14 and -7

(vii) 5 1/8 and -16

(viii) 35 and -18/25

(ix) 6 2/3 and -3/8

(x) 3 3/5 and -10

(xi) 27/28 and -14

(xii) -24 and 5/16

(vi) 2 1/14 and -7
It can be written as
= (2 × 14 + 1)/ 14 × (-7)
By further calculation
= 29/4 × (-7)
So we get
= (29 × -1)/ 2
= -29/2

(vii) 5 1/8 and -16
It can be written as
= 41/8 × -16
By further calculation
= 41 × -2
= -82

(viii) 35 and -18/25
It can be written as
= 35 × -18/25
By further calculation
= (35 × -18)/ 25
So we get
= (7 × -18)/ 5
= -126/5

(ix) 6 2/3 and -3/8
It can be written as
= 20/3 × -3/8
By further calculation
= (20 × -3)/ (3 × 8)
So we get
= (5 × -1)/ (1 × 2)
= -5/2

x) 3 3/5 and -10
It can be written as
= (3 × 5 + 3)/ 5 × -10
By further calculation
= 18/5 × -10
So we get
= 18 × -2
= -36

(xi) 27/28 and -14
It can be written as
= 27/28 × -14
By further calculation
= (27 × -1)/ 2
= -27/2
(xii) -24 and 5/16
It can be written as
= (-24 × 5)/ 16
By further calculation
= (-3 × 5)/ 2
So we get
= -15/2

(v) (-35/39 × -13/7) – (7/90 × -18/14)

It can be written as

= (-35/39 × -13/7) – (7/90 × -18/14)

By further calculation

= (-5 × -1)/ (3 × 1) – (1 × -1)/ (5 × 2)

So we get

= 5/3 – (-1/10)

LCM of 3 and 10 is 30

= (5 × 10)/ (3 × 10) + 1/ (10 × 3)

We get

= (50 + 3)/ 30

= 53/30

= 1 23/30

(vi) (-4/5 × 3/2) + (9/-5 × 10/3) – (-3/2 × -1/4)

It can be written as

= (-2 × 3)/ (5 × 1) + (3 × 2)/ (-1 × 1) – (-3 × -1)/ (2 × 4)

By further calculation

= -6/5 + -6/1 – 3/8

LCM of 5, 1 and 8 is 40

= = (-6 × 8)/ (5 × 8) – (6 × 40)/ (1 × 40) – (3 × 5)/ (8 × 5)

So we get

= (-48 – 240 – 15)/ 40

= – 303/40

4. Find the cost of 3 ½ m cloth, if one metre cloth costs Rs 325 ½.

Solution:

It is given that cost of one metre cloth = ₹ 325 ½

We can write it as

= (2 × 325 + 1)/ 2

By further calculation

= (650 + 1)/ 2

= ₹ 651/2

Cost of 3 ½ m cloth

(2 × 3 + 1)/ 2 = 7/2 m

We get

= 651/2 × 7/2

It can be written as

= (651 × 7)/ (2 × 2)

= 4557/4

= Rs 1139 ¼

5. A bus is moving with a speed of 65 ½ km per hour. How much distance will it cover in 1 1/3 hours.

Solution:

It is given that

Speed of bus = 65 ½ km per hour

We can write it as

= (2 × 65 + 1)/ 2

By further calculation

= (130 + 1)/ 2

= 131/ 2 km

Distance covered in 1 1/3 hour = 4/3 hour can be written as

= 131/2 × 4/3

We get

= 131/1 × 2/3

We know that distance covered = speed × time

= 131/2 × 4/3

= (131 × 2)/ (1 × 3)

So we get

= 262/3

= 87 1/3 km

H.W.
Exercise 2D Q.No. 1 and AHA

THANKING YOU

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