CLASS: 8TH

SUBJECT: MATHEMATICS

SESSION 2024- 2025

Assessment 1

RATIONAL NUMBERS

EXERCISE 1.1

Q1. Using appropriate find:

(1) $-\frac{2}{3}x\frac{3}{5}+\frac{5}{2}-\frac{3}{5}x\frac{1}{6}$

(2) $\frac{2}{5}x\left[-\frac{3}{7}\right]-\frac{1}{6}x\frac{3}{2}+\frac{1}{14}x\frac{2}{5}$

Solution : (1) $-\frac{2}{3}x\frac{3}{5}+\frac{5}{2}-\frac{3}{5}x\frac{1}{6}=-\frac{2}{3}x\frac{3}{5}-\frac{3}{5}x\frac{1}{6}+\frac{5}{2}$ **Using commutativity of rational number**

$=-\frac{3}{5}x\left[\frac{2}{3}+\frac{1}{6}\right]+\frac{5}{2}$ **(using distributive property)**

$=-\frac{3}{5}\left[\frac{2X2+1}{6}\right]+\frac{5}{2}=\frac{-3}{5}\left[\frac{5}{6}\right]+\frac{5}{2}$

$=\left[\frac{-3}{6}\right]+\frac{5}{2}=\left[\frac{-3+5X3}{6}\right]$

$=\left[\frac{-3+15}{6}\right]$

$=\left[\frac{12}{6}\right]$

$=2$

Solution: $(2)\frac{2}{5}x-\frac{3}{7}-\frac{1}{6}x\frac{3}{2}+\frac{1}{14}x\frac{2}{5}=\frac{2}{5}x\left[-\frac{3}{7}\right]+\frac{1}{14}x\frac{2}{5}-\frac{1}{6}x\frac{3}{2}$ **(BY COMMUTATIVITY)**

$=\frac{2}{5}x\left[-\frac{3}{7}+\frac{1}{14}\right]-\frac{1}{4}$ **(BYDISTRIBUTIVITY)**

$=\frac{2}{5}x\left[-\frac{3X2+1}{14}\right]-\frac{1}{4}=\frac{2}{5}x\left[-\frac{5}{14}\right]-\frac{1}{4}=\frac{-1}{7}-\frac{1}{4}=\frac{-4-7}{28}=-\frac{11}{28}$

Q2. Write the additive inverse of each of the following:

(1) $\frac{2}{8}$

Additive inverse

$=-\frac{2}{8}$

(2) $-\frac{5}{9} = \frac{5}{9}$

Q3. Verify that $-(-X)=X$ for

(i) $X = \frac{11}{15}$

(ii) $X = -\frac{13}{17}$

Sol. (i): $X = \frac{11}{15}$

The additive inverse of $X = \frac{11}{15}$ **is** $-X = -\frac{11}{15}$

This equality $\frac{11}{15} + -\frac{11}{15} = 0$ **represents that the additive inverse of** $\frac{11}{15}$ **is** $-\frac{11}{15}$ **or it can be said that** $-\left[-\frac{11}{15}\right] = \frac{11}{15}$ **I,e** $-(-X) = X$

Sol . (ii): $X = -\frac{13}{17}$

The additive inverse of $= -\frac{13}{17}$ **is** $-X = \frac{13}{17}$ **as** $-\frac{13}{17} + \frac{13}{17} = 0$

This equality $-\frac{13}{17} + \frac{13}{17} = 0$ **represents that the additive inverse of** $-\frac{13}{17}$ **is** $\frac{13}{17}$ **I,e** $-(-X) = X$

Q4. Find the multiplicative inverse of the following.

(1) -13 multiplication inverse = $-\frac{1}{13}$

(2) $\frac{1}{5}$ **multiplication inverse = 5**

Q5. Name the property under multiplication used in each of the following .

(i) $\frac{-4}{5} \times 1 = 1 \times \frac{-4}{5} = \frac{-4}{5}$ **(1 is multiplicative identity)**

(ii) $\frac{-13}{17} \times \frac{-2}{7} = \frac{-2}{7} \times \frac{-13}{17}$ **(commutativity property)**

(iii) $\frac{-19}{29} \times \frac{-29}{19} = 1$ **(multiplicative inverse)**

Q6 . Multiply $\frac{6}{13}$ **by the reciprocal of** $-\frac{7}{16}$ **?**

Sol. $\frac{6}{13} \times \left[reciprocal\ of\ -\frac{7}{16}\right] = \frac{6}{13} \times -\frac{16}{7} = -\frac{96}{91}$

Q7. Tell what property allows you to compute $\frac{1}{3} \times \left[6X\ \frac{4}{3}\right]$ **as** $\left[\frac{1}{3}\ X\ 6\right] \times \frac{4}{3}$

Sol. Associativity property.

Q8. IS $\frac{8}{9}$ The multiplicative inverse of $-1\frac{1}{8}$? Why or why not?

Sol. If it is the multiplicative inverse, then the product should be 1.

However, here, the product is not 1 as $\frac{8}{9} \times -1\frac{1}{8} = \frac{8}{9} \times -\frac{9}{8} = -1 \neq 1$

Q9. Is 0.3 the multiplicative inverse of $3\frac{1}{3}$? why or why not ?

Sol. $0.3 \times 3\frac{1}{3} = 0.3 \times \frac{10}{3} = \frac{3}{10} \times \frac{10}{3} = 1$

Here , the product is 1 . Hence, 0.3 is the multiplicative inverse of $3\frac{1}{3}$.

Q10. WRITE .

(1) The rational number that does not have a reciprocal .
Sol. 0 is the rational number but its reciprocal is not defined .
(2) The rational number that are equal to their reciprocals .
Sol . 1 and -1 are the rational numbers that are equal to their reciprocals .
(3) The rational number that is equal to its negative .
Sol. 0 is the rational number that is equal to its negative .

Q11. Fill in the blanks.

(1) Zero has <u>no</u>reciprocal .
(2) The numbers <u>1</u> and <u>-1</u> are their own reciprocals .
(3) The reciprocal of -5 is $-\frac{1}{5}$.
(4) Reciprocal of $\frac{1}{x}$, where $x \neq 0$ is <u>X</u>
(5) The product of two rational numbers is always a <u>rational number</u>
(6) The reciprocal of a positive rational number is <u>positive rational number</u>

CHAPTER 2LINEAR EQUATION IN ONE VARIABLE.

Exercise 2.3

Q1:Solve and check the result:

1. 3X =2X +18

Sol. On transposing 2X to L.H.S, we obtain

3X -2X =18

X **=18**

L.H.S=3X=54

R.H.S=2X+18=54

Thus, L.H.S =R.H.S

2. 5t -3=3t -5

Sol. On transposing 3t to L.H.S and -3 to R.H.S, we obtain

5t -3t =-5+3

2t =-2

On dividing b/s by 2, we obtain

t **=-1**

L.H.S=5t -3 =-8

R.H.S =3t-5 =-8

Thus, L.H.S =R.H.S

3. 5X+9=5+3X

SOL. On transposing 3x to L.H.S and 9 to R.H.S,we obtain

$5X$ -3X =5-9

2X =-4

On dividing b/s by 2, we obtain

X=-2

L.H.S =5X+9 =-1

R.H.S =5+3X=-1

Thus, L.H.S =R.H.S

4. 4Z+3 =6+2Z

SOL. On transposing 2Z to L.H.S and 6 to R.H.S, we obtain

4Z -2Z=6 -3

2Z =3

On dividing b/s by 2, we obtain

$$Z=\frac{3}{2}$$

L.H.S =4Z +3=9

R.H.S =6+2Z =9

Thus, L.H.S =R.H.S

Q5. 2X -1 =14-X

SOL. On transposing X to L.H.S and 1 to R.H.S,we obtain

2X+X =14 +1

3X = 15

On dividing b/s by 3, we obtain

X= 5

L.H.S =2X -1 =9

R.H.S =14 –X =9

Thus, L.H.S=R.H.S

Note: Take rest of the parts accordingly.

Exercise 2.5

Solve the following linear equations.

a. x/2 - 1/5 = x/3 + ¼

sol: x/2 - 1/5 = x/3 + ¼

x/2 – x/3 = ¼ + 1/5

$\frac{3x-2x}{6} = \frac{5+4}{20}$

x / 3 = 9/10

X = 27/10

ii) $\frac{n}{2}$ – 3n / 4+5n/6=21

Sol) n/2-3n/4+5n/6=21

$$\frac{6n - 9n + 10n}{12} = 21$$

$$\frac{16n - 9n}{12} = 21$$

$$\frac{7n}{12} = 21$$

N= 3 x 12

N= 36

iv) $\frac{x-5}{3} = \frac{x-3}{5}$

5(x-5) = 3 (x-3)

5x – 25 = 3x – 9

5x – 3x = -9 +25

2x = 16

X = 8

7. 3(t-3) = 5(2t +1)

Sol: 3(t-3) = 5(2t +1)

= 3t – 9 = 10t +5

= 3t – 10t = 5+9

= -7t = 14

= t = -2

9. 3(5z -7) – 2 (9z -11) = 4(8z-13) -17

Sol: 3(5z -7) – 2 (9z -11) = 4(8z-13) -17

15z -21 -18z +22 = 32z -52 -17

15z -18z -21+22 = 32z-69

-3z +1 = 32z -69

-3z -32z = -69 -1

-35z = -70

Z = 2

10. 0.25 (4f -3) = 0.05 (10f -9)

Sol: 0.25 (4f -3) = 0.05 (10f -9)

$\frac{25}{100}$ (4f -3) = $\frac{5}{100}$ (10f -9)

100f -75 = 50f -45

100f -50f = -45 +75

50f = 30

f= $\frac{30}{50}$

f = $\frac{3}{5}$ ➔ f = 0.6