CLASS : 5

SUBJECT : MATHEMATICS

TOPIC : FRACTIONS

WORKSHEET

SYNOPSIS:

- Fractions can be added, subtracted, multiplied and divided.
- To add like fractions, we add the numerators and copy the denominator.
- To add unlike fractions, they must first be converted into like fractions by calculating the LCM. Then, add the numerators and copy the denominator.
- While adding mixed fractions, they must be converted to improper fractions. Then, unlike fractions have to be changed to like fractions using the LCM of denominators. Further, add the numerators and copy the denominator.
- To subtract the like fractions, subtract the smaller numerator from the bigger numerator and copy the denominator.
- To subtract unlike fractions, first convert them to like fractions and then subtract them.
- To subtract mixed fractions, first convert the mixed fractions to improper fractions. Then, convert the unlike fractions to like fractions using the LCM of the denominators. At last, subtract the smaller fraction from the larger one.
- In order to multiply fractions with whole numbers, write the whole number as a fraction. Then multiply the numerators and denominators. Finally, reduce to the lowest terms.
- To multiply fractions with fractions, we have to multiply the numerators and the denominators. Then reduce to the lowest terms if required. Also, we can divide the numerators and the denominators by common factors and then multiply.
- We need to know multiplicative inverse to understand division of fractions. Two numbers are the multiplicative inverse of each other if their product is 1. For example,

$$\frac{3}{4} \times \frac{4}{3} = 1$$

So, $\frac{4}{3}$ is the multiplicative inverse of $\frac{3}{4}$ and vice versa.

- We can divide a whole number by a fraction, a fraction by a fraction and a fraction by a whole number.

EXAMPLES:

A. *Adding like fractions:*

Add $\frac{3}{7}$ and $\frac{2}{7}$

$$\frac{3}{7} + \frac{2}{7} = \frac{3+2}{7} = \frac{5}{7} \text{ (Ans.)}$$

B. Adding unlike fractions:

Add $\dfrac{1}{4}$ and $\dfrac{1}{3}$

The fractions $\dfrac{1}{4}$ and $\dfrac{1}{3}$ are unlike fractions.

Convert unlike fractions to like fractions and then add them.

$$\dfrac{1\times 3}{4\times 3}=\dfrac{3}{12}; \quad \dfrac{1\times 4}{3\times 4}=\dfrac{4}{12}$$

> To convert into like fractions, take the LCM of the denominators, 4 and 3.

$$\dfrac{3}{12}+\dfrac{4}{12}=\dfrac{3+4}{12}=\dfrac{7}{12}$$

(Ans.) $\dfrac{7}{12}$

C. Adding mixed fractions:

Add $2\dfrac{1}{8}$ and $3\dfrac{5}{16}$

STEP 1 Change mixed numbers to improper fractions. $2\dfrac{1}{8}=\dfrac{17}{8}; \quad 3\dfrac{5}{16}=\dfrac{53}{16}$

STEP 2 Change unlike fractions to like fractions using the LCM of the denominators. $\dfrac{17}{8}=\dfrac{17\times 2}{8\times 2}=\dfrac{34}{16}; \quad \dfrac{53}{16}$

STEP 3 Add the fractions and change to mixed number.

$$\dfrac{34}{16}+\dfrac{53}{16}=\dfrac{34+53}{16}=\dfrac{87}{16}=5\dfrac{7}{16}$$

(Ans.) $5\dfrac{7}{16}$

D. Subtract like fractions:

Subtract $\dfrac{2}{5}$ from $\dfrac{3}{5}$

$$\dfrac{3}{5}-\dfrac{2}{5}=\dfrac{3-2}{5}=\dfrac{1}{5} \quad \text{(Ans.)}$$

E. Subtract unlike fractions:

Subtract $\dfrac{5}{8}$ and $\dfrac{2}{7}$

The fractions $\dfrac{5}{8}$ and $\dfrac{2}{7}$ are unlike fractions.

Convert unlike fractions to like fractions and then subtract them.

$$\dfrac{5\times 7}{8\times 7}=\dfrac{35}{56}; \quad \dfrac{2\times 8}{7\times 8}=\dfrac{16}{56}$$

> To convert into like fractions, find the LCM of the denominators.

$$\dfrac{35}{56}-\dfrac{16}{56}=\dfrac{35-16}{56}=\dfrac{19}{56}$$

(Ans.) $\dfrac{19}{56}$

F. Subtracting mixed fractions:

Subtract $3\frac{2}{3}$ and $5\frac{1}{2}$

STEP 1	Convert mixed numbers to improper fractions.	$5\frac{1}{2} = \frac{11}{2}; \quad 3\frac{2}{3} = \frac{11}{3}$
STEP 2	Convert unlike fractions to like fractions using the LCM of the denominators.	$\frac{11}{2} = \frac{11 \times 3}{2 \times 3} = \frac{33}{6};$ $\frac{11}{3} = \frac{11 \times 2}{3 \times 2} = \frac{22}{6}$
STEP 3	Subtract the fractions and convert the difference to a mixed number.	$\frac{33}{6} - \frac{22}{6} = \frac{33-22}{6} = \frac{11}{6} = 1\frac{5}{6}$

(Ans.) $1\frac{5}{6}$

G. Multiplying fractions with whole numbers:

Multiply 12 and $\frac{1}{4}$

STEP 1	Write the whole number as a fraction.	$12 = \frac{12}{1}$
STEP 2	Multiply the numerators and the denominators.	$\frac{12}{1} \times \frac{1}{4} = \frac{12 \times 1}{1 \times 4} = \frac{12}{4}$
STEP 3	Reduce to the lowest terms.	$\frac{12}{4} = 3$

(Ans.) 3

H. Division of fractions:

1. Divide 3 by $\frac{1}{4}$

STEP 1	Write the whole number as a fraction.	$\rightarrow$ Write 3 as $\frac{3}{1}$.
STEP 2	Write the multiplicative inverse (M.I.) of the divisor.	$\rightarrow$ M.I. of $\frac{1}{4}$ is $\frac{4}{1}$.
STEP 3	Multiply the dividend, and the M.I. of the divisor.	$\rightarrow$ $\frac{3}{1} \times \frac{4}{1} = \frac{12}{1} = 12$

(Ans.) 12

2. Divide $\frac{8}{11}$ by $\frac{1}{11}$

Here, the dividend is $\frac{8}{11}$

The Multiplicative Inverse of divisor $\frac{1}{11}$ is $\frac{11}{1}$

So, $\frac{8}{11} \div \frac{1}{11} = \frac{8}{11} \times \frac{11}{1} = \frac{88}{11} = 8$ (Ans.)

I. **Find the sum:**

    a) $\frac{1}{9} + \frac{7}{9}$ b) $1\frac{2}{3} + 4\frac{1}{2} + 2$

II. **Find the difference:**

    a) $2 - \frac{1}{4}$ b) $\frac{5}{4} - \frac{1}{4}$ c) $5 - 2\frac{1}{2}$

III. **Multiply :**

    a) $\frac{2}{25} \times 100$ b) $\frac{2}{3} \times 60$ c) $\frac{2}{7} \times \frac{3}{5}$

IV. **Divide :**

    a) $\frac{5}{9} \div \frac{10}{3}$ b) $\frac{5}{6} \div \frac{2}{3}$ c) $\frac{5}{20} \div \frac{20}{8}$

V. **Word problems:**

    a) Sofia bought $\frac{3}{8}$ metre of a red ribbon and $\frac{1}{8}$ metre of yellow ribbon. What is the total length of ribbon that she bought?

    b) A reel of ribbon contains $12\frac{1}{2}$ m of ribbon. If Mrs. Dutta used $4\frac{1}{2}$ m of ribbon, how much ribbon is left?

    c) The tailor used $2\frac{1}{2}$ m of cloth to stitch a skirt. How much cloth does he need to stitch 5 skirts?

    d) $\frac{1}{6}$ metre of a ribbon is needed to make a bow. How many bows can Sunita make from a 3 metre ribbon?

VI. **Complete the following exercises from the chapter:**

    a) Exercise 4.4 (A) Sum Nos. 1 to 5 on Page No. 68.
    b) Exercise 4.4 (B) Sum No. 3 on Page No. 68.
    c) Exercise 4.5 (A) Sum Nos. 5 to 10 on Page No. 70.
    d) Exercise 4.5 (B) Sum No. 2 on Page no. 70.
    e) Exercise 4.6 (B) Sum Nos. 1 to 3 on Page No. 72.
    f) Exercise 4.7 (B) Sum Nos. 1 to 3 on Page No. 73.
    g) Exercise 4.8 (C) Sum Nos. 1 to 5 on Page No. 76.