CLASS-7

LESSON-2 FRACTION AND DECIMAL

(This PDF Based on NCERT Book)

FRACTION(भिन्न)- A fraction represents a part of a whole or a part of a set. It's written as a ratio of two numbers, the **numerator** and the **denominator**.

Ex- $\frac{1}{2}$ 1 is numerator and 2 is denominator.

MULTIPLICATION OF FRACTION(भिन्नो का गुणन)-

Steps for Multiplying Fractions

1. **Multiply the numerators together.**
2. **Multiply the denominators together.**
3. **Simplify** the new fraction if possible.

Ex-

$$\frac{2}{3} \times \frac{4}{5} = \frac{2 \times 4}{3 \times 5} = \frac{8}{15}$$

The fraction 8/15 cannot be simplified further, so that is the final answer.

Multiplying with Whole Numbers(पूर्ण संख्या से गुणन):

To multiply a fraction by a whole number, turn the whole number into a fraction by putting a 1 under it.

Ex:

$$5 \times \frac{7}{2}$$

First, turn 5 into a fraction: 5=1/5. Now, multiply the two fractions:

$$\frac{1}{5} \times \frac{7}{2} = \frac{1 \times 7}{5 \times 2} = \frac{7}{10}$$

You can leave the answer as an improper fraction or convert it to a mixed number:

$$7/10 = 1\frac{7}{3}$$

Multiplying Mixed Numbers(मिश्रित संख्या का गुणन):

To multiply mixed numbers (a whole number and a fraction), you must first convert them into **improper fractions**.

Ex:

$$1\frac{1}{2} \times 2\frac{1}{3}$$

1. **Convert to improper fractions:**
   - $1\frac{1}{2} = \frac{(1 \times 2) + 1}{2} = 2/3$
   - $2\frac{1}{3} = \frac{(2 \times 3) + 1}{3} = 3/7$
2. **Multiply the new fractions:**

   $$\frac{2}{3} \times \frac{3}{7} = \frac{2 \times 3}{3 \times 7} = \frac{6}{21}$$

3. **Simplify the answer:**
   - The fraction can be simplified by dividing both the numerator and the denominator by their greatest common factor, which is 3.

     $$\frac{6 \div 3}{21 \div 3} = \frac{2}{7}$$

   - You can also convert the final improper fraction back into a mixed number.

     $$2/7 = 3\frac{1}{2}$$

DIVISION OF FRACTIONS(भिन्नो का भाग)-

Steps for Dividing Fractions

1. **Keep** the first fraction as it is.
2. **Change** the division sign to a multiplication sign.
3. **Flip** the second fraction upside down. This is called finding the **reciprocal**.
4. **Multiply** the two fractions just as you would normally (numerator by numerator, denominator by denominator).
5. **Simplify** the final fraction if possible.

Ex- 1: Dividing Two Fractions

Let's divide 3/4 by 1/2.

$$\frac{3}{4} \div \frac{1}{2}$$

1. **Keep** the first fraction: 4/3
2. **Change** the sign: $\times$

3. **Flip** the second fraction: 2/1 becomes 1/2

Now, the problem is:

$$\frac{3}{4} \times \frac{2}{1} = \frac{3 \times 2}{4 \times 1} = \frac{6}{4}$$

4. **Simplify** the result:
   - The fraction 6/4 is an improper fraction.
   - Both 6 and 4 can be divided by 2.
   - $\dfrac{6 \div 2}{4 \div 2} = \dfrac{3}{2}$

The final answer is 2/3 or the mixed number $1\dfrac{1}{2}$.

Division with Whole Numbers and Mixed Numbers(पूर्ण संख्या और मिश्रित संख्या से भाग):

- **Whole Numbers:** To divide a fraction by a whole number, first turn the whole number into a fraction by putting a 1 under it. For Ex, 5 becomes5/1.
- **Mixed Numbers:** To divide mixed numbers, you must first convert them into **improper fractions**. For Ex, $1\dfrac{1}{2}$. becomes 2/3.

DECIMAL(दशमलव)- A decimal is a number that includes a decimal point to show a part of a whole.

Ex- 2.4, 4.5, 0.9, 54.5 etc.

MULTIPLICATION OF DECIMAL NUMBERS(दशमलव संख्याओ का गुणन):

1. **Ignore the decimal points** and multiply the numbers as if they were whole numbers.
2. **Count the total number of decimal places** in the original numbers. A "decimal place" is any digit to the right of the decimal point.
3. **Place the decimal point** in your answer by counting from the right side and moving the decimal point to the left the same number of places as the total you counted in the previous step.

Ex-

Let's multiply **2.5** by **1.3**.

1. **Ignore the decimal points** and multiply **25** by **13**.
   - 25×13=325
2. **Count the decimal places** in the original numbers.
   - In **2.5**, there is one digit after the decimal point (the 5).
   - In **1.3**, there is one digit after the decimal point (the 3).
   - The total number of decimal places is **1+1=2**.
3. **Place the decimal point** in the answer.

- o Start with your product, 325.
- o Count two places from the right and place the decimal point.
- o 3.25

So, 2.5×1.3=3.25.

DIVISION OF DECIMAL NUMBERS(दशमलव संख्या की भाग)-

How to Divide Decimals

The most common method is to use these steps:

1. **Move the decimal point** in the **divisor** to the right until it is a whole number. Count how many places you moved it.
2. **Move the decimal point** in the other number (**the dividend**) the **same number of places** to the right. You may need to add zeros to the end of the number to do this.
3. **Place the decimal point** for your answer directly above the new decimal point in the dividend.
4. **Divide** the numbers just like you would with whole numbers.

Types of Decimal Division(दशमलव संख्या के भाग के प्रकार):

There are three main types of decimal division problems:

1. **Dividing a Decimal by a Whole Number(दशमलव का पूर्ण संख्या से भाग):** This is the most straightforward type. You just place the decimal point in the answer directly above the decimal point in the dividend and divide.
    - o **Ex-:** 9.3÷3
        - ▪ Place the decimal point in the answer above the decimal in 9.3.
        - ▪ Divide 9 by 3, which is 3.
        - ▪ Divide 3 by 3, which is 1.
        - ▪ The answer is **3.1**.
2. **Dividing a Whole Number by a Decimal(पूर्ण संख्या का दशमलव से भाग):** For this type, you must first make the divisor a whole number.
    - o **Ex-:** 25÷0.5
        - ▪ Move the decimal point in **0.5** one place to the right to get **5**.
        - ▪ Move the decimal point in **25** (which is 25.0) one place to the right to get **250**.
        - ▪ Now divide: 250÷5=50.
        - ▪ The answer is **50**.
3. **Dividing a Decimal by a Decimal(दशमलव का दशमलव से भाग):** This is the most common and involves applying the core rule of making the divisor a whole number.
    - o **Ex-:** 6.25÷2.5
        - ▪ Move the decimal point in **2.5** one place to the right to get **25**.
        - ▪ Move the decimal point in **6.25** one place to the right to get **62.5**.
        - ▪ Now divide: 62.5÷25.
        - ▪ The answer is **2.5**.

Special Case: Division by Powers of 10(10 की घाट से विभाजन):

When you divide a decimal number by 10, 100, 1000, etc., you can use a shortcut. Simply move the decimal point to the **left** by the number of zeros in the power of 10.

- **Ex-:** 45.6÷10
  - 10 has **one** zero, so move the decimal point one place to the left.
  - The answer is **4.56**.