



STUDY COURSE MATERIAL

MATHEMATICS

SESSION-2020-21

CLASS-V

TOPIC: Fractions

DAY-1

❖ TEACHING MATERIAL

Fractions

- When a whole is divided into equal parts, each part is called a fraction of the whole . All the fractions taken together make a whole.

For examples : The given circle is divided into four equal parts , each part is $\frac{1}{4}$ and the whole is $4 \times \frac{1}{4}$.



Type equation here.

- It can be defined as 'A part of collection of things is a fraction fraction of the whole collection'.



Numerator
(number on the top)

$$\frac{3}{4}$$

Denominator
(number on the bottom)

TYPES OF FRACTIONS:

- **UNIT FRACTION** : Fractions with numerator one are called unit fractions.
Example : $\frac{1}{4}$, $\frac{1}{8}$ etc are unit fractions.
- **PROPER FRACTION** : A fraction whose numerator is smaller than the denominator is called proper fraction.
Examples : $\frac{2}{3}$, $\frac{4}{7}$ etc are the proper fractions.
- **IMPROPER FRACTION** : A fraction whose numerator is greater than the denominator is called proper fraction.
Examples : $\frac{5}{2}$, $\frac{7}{5}$ etc are the improper fractions.
- **MIXED NUMBERS OR MIXED FRACTIONS** : When an improper fraction is written as a whole number and a proper fraction , it is called a mixed number or a mixed fraction.
Examples : $1\frac{1}{3}$, $4\frac{5}{8}$ etc are mixed fractions.
- **LIKE FRACTIONS** : Fractions with the same denominators are called like fractions.
Examples : $\frac{4}{5}$, $\frac{6}{5}$, $\frac{7}{5}$ etc are like fractions.
- **UNLIKE FRACTIONS** : Fractions with the different denominators are called like fractions.

Examples : $\frac{1}{5}, \frac{4}{7}, \frac{5}{8}$ etc are unlike fractions.

❖ VIDEO-LINK

<https://youtu.be/ZGmyYCOFvsE>

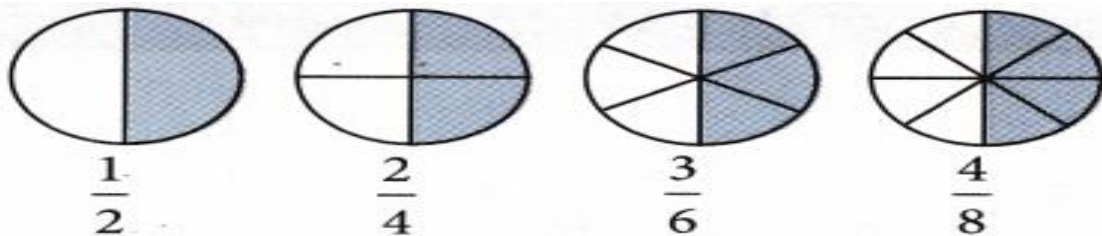
DAY-2

❖ TEACHING MATERIAL

Equivalent Fractions

- An equivalent fraction of a given fraction is obtained by multiplying or dividing its numerator and denominator by the same number (which should not be zero.)

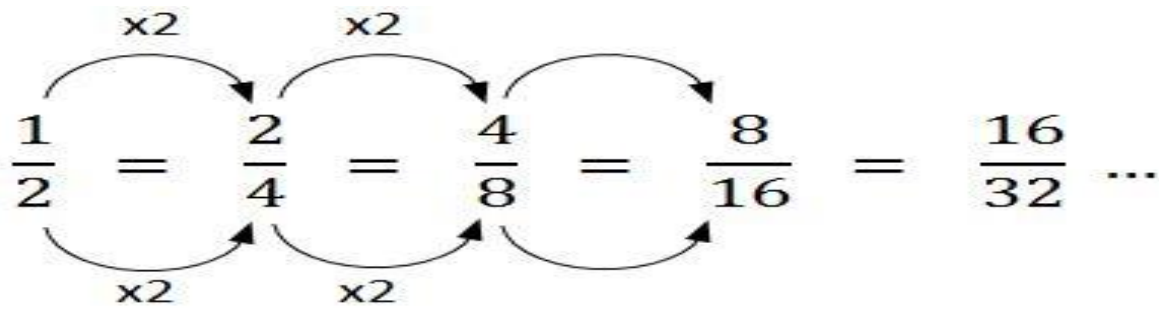
$$\frac{1}{2} = \frac{1 \times 2}{2 \times 2} = \frac{2}{4} ; \frac{1}{2} = \frac{1 \times 3}{2 \times 3} = \frac{3}{6} ; \frac{1}{2} = \frac{1 \times 4}{2 \times 4} = \frac{4}{8} ; \frac{6}{9} = \frac{6 \div 3}{9 \div 3} = \frac{2}{3}$$



Question: Write three fractions equivalent to $\frac{4}{7}$.

$$\text{Solution : } \frac{4}{7} = \frac{4 \times 2}{7 \times 2} = \frac{8}{14} ; \frac{4}{7} = \frac{4 \times 3}{7 \times 3} = \frac{12}{21} ; \frac{4}{7} = \frac{4 \times 4}{7 \times 4} = \frac{16}{28}$$

Fractions equivalent to $\frac{4}{7}$ are $\frac{8}{14}, \frac{12}{21}, \frac{16}{28}$.



- A fraction is in its simplest form if the highest common factor of the numerator and denominator is 1.

Q.Reduce $\frac{35}{36}$ to the lowest term.

Solution : HCF (35,36) = 1

Therefore , the fraction is already in its lowest term.

❖ VIDEO-LINKS

<https://youtu.be/hnIxLf8KLUY>

DAY-3

❖ TEACHING MATERIAL

ADDITION OF FRACTIONS :

Addition of Like Fractions :

$$\text{Add: } \frac{7}{9} + \frac{2}{9}$$

$$= \frac{9}{9}$$

$$= 1$$

Addition of Unlike Fractions :

Find the sum of $\frac{2}{5} + \frac{4}{15}$

LCM of denominators (5,15) = 15

We change the fractions to like fractions and then add:

$$\frac{2}{5} = \frac{2 \times 3}{5 \times 3} = \frac{6}{15}$$

$$\frac{2}{5} + \frac{4}{15} = \frac{6}{15} + \frac{4}{15} = \frac{10}{15} = \frac{2}{3}$$

Subtraction of Fractions :

We first change the fractions to like fractions.

Questions : Subtract : $\frac{7}{15} - \frac{2}{5}$

Solution : LCM of (5,15) = 15

$$\frac{7}{15} - \frac{2 \times 3}{5 \times 3} = \frac{7}{15} - \frac{6}{15} = \frac{1}{15}$$

❖ VIDEO-LINKS

<https://youtu.be/shZbOjDqKYM>

DAY-4

Simplification :

$$\frac{6}{9} - \frac{2}{9} + \frac{7}{9} - \frac{5}{9}$$

$$= \frac{6 - 2 + 7 - 5}{9} = \frac{13 - 7}{9} = \frac{6}{9} = \frac{2}{3}$$

Multiplication of Fractions :

➤ Multiplication is repeated addition .

Example : Ruby has a bar of chocolates with four pieces in it. She ate one piece of chocolate every day and the chocolates was finished in four days.

We can also write : $\frac{1}{4} + \frac{1}{4} + \frac{1}{4} + \frac{1}{4} = \frac{4}{4} = 1$

Multiplication of a Fraction by a Whole Number :

Multiply $\frac{2}{3}$ by 6

➤ a) By repeated addition : $\frac{2}{3} + \frac{2}{3} + \frac{2}{3} + \frac{2}{3} + \frac{2}{3} + \frac{2}{3} = \frac{12}{3} = 4$

➤ Multiply the denominators and multiply the numerators :

$$\frac{2}{3} \times \frac{6}{1} = \frac{2 \times 6}{3 \times 1} = \frac{12}{3} = 4$$

- **Fraction of a Number:**

Example : Find $\frac{2}{5}$ of 30

Solution : $\frac{2}{5} \times 30 = 2 \times 6 = 12$

❖ VIDEO-LINKS

<https://youtu.be/987ISYKeEts>

DAY-5

- **Reciprocal of a Number :**

- The reciprocal of a fraction is obtained by interchanging the numerator and the denominator .
- Writing the fraction upside down will give the reciprocal.
- The reciprocal is also called multiplicative inverse.

NOTE: Reciprocal of 1 is 1 and 0 has no reciprocal.

Example : Proper fraction $\frac{2}{5}$ has a reciprocal $\frac{5}{2}$ which is an improper fraction.

Question : Find the reciprocal of 7 and their product.

Solution : Reciprocal of 7 is $\frac{1}{7}$.

$$\text{Product} = 7 \times \frac{1}{7} = 1$$

- **Division by a fraction:**

Division of a Whole Number by a Fraction

- Number of halves $[\frac{1}{2}]$ in 1 = $1 \div \frac{1}{2} = 1 \times 2 = 2$
- Number of one – fourth $[\frac{1}{4}]$ in 2 = $2 \div \frac{1}{4} = 2 \times \frac{4}{1} = 8$
- Number of three – fourths in 3 = $3 \div \frac{3}{4} = 3 \times \frac{4}{3} = 4$

- **Division of fractions :**

$7 \div 2$ can be written as $\frac{7}{2}$ or $7 \times \frac{1}{2}$. now $\frac{1}{2}$ is the reciprocal of 2.

So division by a number is the same as multiplication by the reciprocal of that number. This is how we divide fractions.

Examples : Divide : $\frac{2}{5} \div 4$

$$= \frac{2}{5} \times \frac{1}{4} = \frac{2}{20} = \frac{1}{10}$$

➤ **Story Sums :**

Example : Rajan bought $2\frac{1}{2}$ kg of mangoes costing Rs. $50\frac{1}{2}$ per kg.

Find the total amount he has to pay the shopkeeper.

Solution: Cost of 1 kg mangoes = Rs. $50\frac{1}{2}$

$$\begin{aligned} \text{Cost of } 2\frac{1}{2} \text{ kg mangoes} &= 50\frac{1}{2} \times 2\frac{1}{2} \\ &= \frac{101}{2} \times \frac{5}{2} \\ &= \frac{505}{4} = \text{Rs. } 126\frac{1}{4} \end{aligned}$$

Related questions:

Q1. Write an equivalent fraction of $\frac{70}{84}$ with denominator 6.

Q2. Reduce the following to the lowest term:

a) $\frac{28}{35}$

b) $\frac{24}{72}$

Q3. Add : $\frac{3}{7} + \frac{2}{7} + \frac{5}{7}$

Q4. Subtract : $2\frac{1}{4} - \frac{7}{12}$

Q5. Convert into like fractions and subtract $\frac{3}{7}$ from $\frac{5}{9}$.

Q6. Multiply : $3\frac{3}{5} \times \frac{7}{9}$

Q7. How much is $\frac{5}{7}$ of 42 kg?

Q8. Divide : $\frac{2}{5} \div 4$

Q9. Compare $\frac{6}{7}$ and $\frac{3}{8}$.

Q10. How much is $\frac{3}{4}$ of a km?