

**Fraction** : A fraction is a number which represents the part of a whole and whole should be divided into equal parts.

**Types of fractions:**

1. *Like fraction* : a set of two or more fractions having same denominator .for ex  $\frac{2}{9}$  ,  $\frac{4}{9}$  ,  $\frac{7}{9}$  are like fractions.
2. *Unlike fraction* : a set of two or more fractions having different denominator . for ex  $\frac{2}{5}$  ,  $\frac{4}{7}$  ,  $\frac{7}{9}$  are unlike fractions.
3. *Proper fraction* : a fraction in which numerator is less than the denominator . for ex  $\frac{2}{5}$  ,  $\frac{4}{7}$  ,  $\frac{7}{9}$  are proper fractions. {note : a proper fraction is always less than a whole number }
4. *Improper fraction* : a fraction in which numerator is greater than or equal to the denominator . for ex  $\frac{5}{2}$  ,  $\frac{7}{4}$  ,  $\frac{9}{7}$  are improper fractions. {note : an improper fraction is always more than one or equal to one }
5. *Unit fraction* : a fraction with numerator as one (1) , is called unit fraction . for ex  $\frac{1}{2}$  ,  $\frac{1}{4}$  ,  $\frac{1}{7}$  are unit fraction .
6. *Mixed fraction* : a fraction with a combination of whole number and fraction . fr ex  $3\frac{1}{2}$  ,  $5\frac{7}{4}$  ,  $2\frac{4}{7}$  are mixed fraction .

**Equivalent fraction** : Two fractions are said to be equivalent fraction if the product of the numerator of the first and denominator of the second fraction is equal to the product of the denominator of the first and the numerator of the second fraction.

Fr example :  $\frac{1}{3}$  and  $\frac{2}{6}$

**NOTE:** we can find whether the given fractions are equivalent or not by various method:

- 1) By cross method .
- 2) By converting the fractions into simplest method.
- 3) By comparison of fractions.

### **COMPARISON OF FRACTIONS :**

- 1) CASE 1: When numerator is same , denominator is different we compare the denominator. The denominator with smaller value is bigger . fr example out of these two fractions  $\frac{5}{2}$  ,  $\frac{5}{4}$  {  $\frac{5}{2} > \frac{5}{4}$  }.
- 2) CASE 2 : When denominator is same , numerator is different we compare the numerator. The numerator with greater value is greater . fr example out of these two fractions  $\frac{5}{7}$  ,  $\frac{6}{7}$  {  $\frac{6}{7} > \frac{5}{7}$  }.
- 3) CASE 3 : When both the numerator and denominator are different, then cross multiply and compare.fr example

$$\frac{2}{3} , \frac{5}{7}$$

$$\frac{2}{3} \begin{array}{c} \swarrow \searrow \\ \nwarrow \swarrow \end{array} \frac{5}{7}$$

$$2 \times 7 \quad 3 \times 5$$

$$14 < 15$$

Therefore,

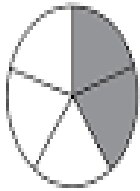
$$\frac{2}{3} < \frac{5}{7}$$

**SIMPLEST FORM :** A fraction is said to be in simplest form if the highest common factor of numerator and denominator is ONE

# WORKSHEET 1

## Part 1

1. How much of the circle is shaded?



- A.  $\frac{3}{5}$       B.  $\frac{2}{3}$   
 C.  $\frac{2}{5}$       D.  $\frac{5}{2}$   
 E. Not here

2. How much of the rectangle is not shaded?



- A.  $\frac{3}{7}$       B.  $\frac{4}{7}$   
 C.  $\frac{4}{3}$       D. 4  
 E. Not here

3. What part of the group of circles is shaded?





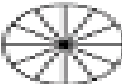
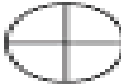


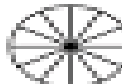
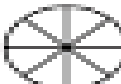
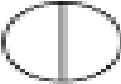
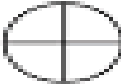
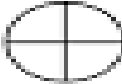

- A.  $\frac{7}{10}$       B.  $\frac{7}{3}$       C.  $\frac{10}{7}$       D. 7      E. Not here

## Equivalent Fractions

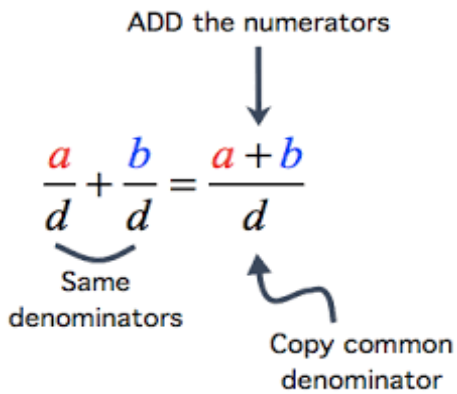
$\frac{1}{4} = \frac{\square}{8}$	$\frac{1}{2} = \frac{\square}{4}$
$\frac{4}{6} = \frac{\square}{12}$	$\frac{2}{3} = \frac{\square}{6}$
$\frac{1}{2} = \frac{\square}{8}$	$\frac{2}{3} = \frac{\square}{12}$
$\frac{3}{6} = \frac{\square}{12}$	$\frac{1}{3} = \frac{\square}{6}$
$\frac{3}{4} = \frac{\square}{8}$	$\frac{5}{6} = \frac{\square}{12}$

Comparing Fractions

Shade and use >, <, or = to compare the fractions.

 $\frac{1}{2}$	 $\frac{1}{3}$	$\frac{1}{2} > \frac{1}{3}$
 $\frac{4}{12}$	 $\frac{2}{4}$	$\frac{4}{12} \square \frac{2}{4}$
 $\frac{3}{4}$	 $\frac{2}{3}$	$\frac{3}{4} \square \frac{2}{3}$
 $\frac{6}{12}$	 $\frac{3}{8}$	$\frac{6}{12} \square \frac{3}{8}$
 $\frac{1}{2}$	 $\frac{3}{4}$	$\frac{1}{2} \square \frac{3}{4}$
 $\frac{2}{4}$	 $\frac{2}{5}$	$\frac{2}{4} \square \frac{2}{5}$

## ADDITION AND SUBTRACTION OF FRACTIONS



### WORKSHEET 2

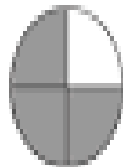
1. Express in simplest form : (a)  $\frac{25}{65}$  (b)  $\frac{104}{169}$

2. Arrange in ascending form :  $\frac{6}{13}, \frac{9}{13}, \frac{3}{13}, \frac{17}{13}, \frac{13}{13}$ .

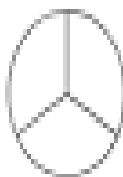
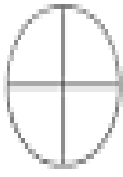
# Peanut Butter and Cabbage Pies

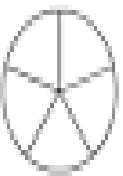
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Colour  $\frac{1}{4} + \frac{2}{4}$    $\rightarrow$   $\frac{1}{4} + \frac{2}{4} = \frac{3}{4}$

Find the total and then shade the equivalent fraction.

$\frac{1}{3} + \frac{1}{3} = \frac{\square}{\square}$    $\frac{2}{4} + \frac{1}{4} = \frac{\square}{\square}$  

$\frac{1}{5} + \frac{2}{5} = \frac{\square}{\square}$    $\frac{3}{5} + \frac{1}{5} = \frac{\square}{\square}$  

$\frac{5}{6} + \frac{1}{6} = \frac{\square}{\square}$    $\frac{2}{6} + \frac{2}{6} = \frac{\square}{\square}$  

## ADDITION AND SUBTRACTION OF UNLIKE FRACTIONS

$$\frac{1}{6} + \frac{2}{9}$$

$$3 \cdot \frac{1}{6} + \frac{2 \cdot 2}{9 \cdot 2}$$

Rewrite with a common denominator.

Multiples of 6: 6, 12, **18**, 24 . . .

Multiples of 9: 9, **18** . . .

$$\frac{3}{18} + \frac{4}{18}$$

Add the fractions (add the numerators, the denominator stays the same).

$$\frac{7}{18}$$

$$\frac{7}{8} - \frac{3}{4}$$

$$\frac{3 \times 2}{4 \times 2} = \frac{6}{8}$$

$$\frac{7}{8} - \frac{6}{8} = \frac{1}{8}$$

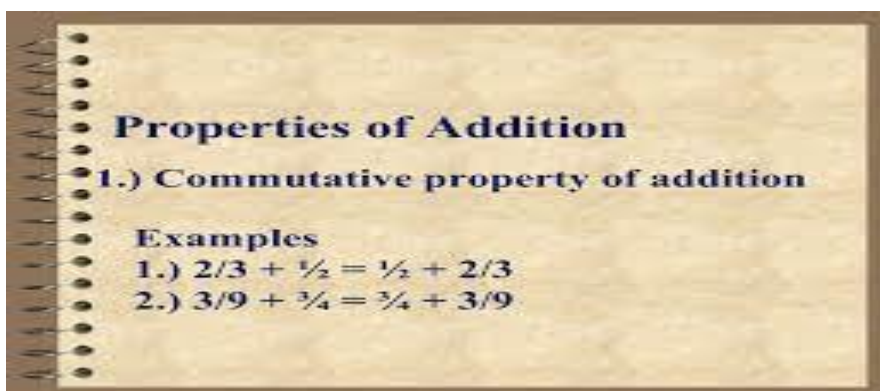
In unlike fraction we have to first make the denominator same and then add or subtract accordingly. { Note: we can make denominator same by multiplying or taking L.C.M of denominators }

## PROPERTIES OF ADDITION OF FRACTIONS

### I. COMMUTATIVE PROPERTY :

If  $\frac{2}{3}$  and  $\frac{5}{7}$  are two fractions, then  $\frac{2}{3} + \frac{5}{7} = \frac{5}{7} + \frac{2}{3}$

This shows by changing the positions of fraction the result remains the same.



### II. ASSOCIATIVE PROPERTY :

## ASSOCIATIVE PROPERTY OF Addition

The property that states that you can group addends in different ways and still get the same sum.

$$\left(\frac{1}{5} + \frac{1}{5}\right) + \frac{3}{5} =$$

$$\left(\frac{1}{5} + \frac{3}{5}\right) + \frac{1}{5}$$

## COMMUTATIVE PROPERTY OF Addition

The property that states that when the order of two addends is changed, the sum is the same.

$$\frac{1}{4} + \frac{2}{4} = \frac{3}{4}$$

$$\frac{2}{4} + \frac{1}{4} = \frac{3}{4}$$

### III. ADDITIVE IDENTITY :

We know that if a fraction added to 0, ie.  $\frac{a}{b} + 0$ , then the result is the same fraction. So ZERO is called the additive identity of any fraction .

$$1 + 0 = 1$$

### WORKSHEET 3

#### 1. Add and solve

$$\frac{4}{3} + \frac{8}{5}$$

$$\frac{3}{11} + 2\frac{8}{5}$$

#### 2. Subtract and solve

$$\frac{17}{18} - \frac{2}{18}$$

$$\frac{2}{1} - \frac{3}{7}$$

