

SUBJECT : MATHEMATICS
CHAPTER NUMBER: 03
CHAPTER NAME : FRACTIONS

CHANGING YOUR TOMORROW

Learning outcomes

Students will be able to

- Differentiate and identify Like and Unlike Fractions
- Convert unlike to like fractions
- Compare Fractions
- Make a comparison in various situations related to our daily life.



LIKE AND UNLIKE FRACTIONS

Fractions having the same denominators are called **like** fractions.

$$\frac{3}{5}, \frac{7}{5}, \frac{9}{5}$$

Fractions having different denominators are called **unlike** fractions.

$$\frac{2}{5}, \frac{5}{9}, \frac{15}{23}, \frac{24}{37}$$

Converting unlike fractions into like fractions

- Steps : Find the L.C.M. of the dr. of all the given fractions.
- For each given fraction , multiply its dr. by a suitable number so that the product obtained in step 1.
- Multiply the nr. also by the same number.

<https://www.youtube.com/watch?v=DMo7W9rE85Y> (2:32minutes)

Comparing fractions

Convert all the given fractions into like fractions , then the fraction with the greater numerator is greater.

Alternate Method

Convert all the given fractions into fractions of equal numerators , then the fraction which has a smaller denominator is greater.

1.Solution:

- (i) $\frac{5}{8}$ and $\frac{7}{8}$ are like fractions.
- (ii) $\frac{8}{15}$ and $\frac{8}{21}$ are unlike fractions.
- (iii) $\frac{4}{9}$ and $\frac{9}{4}$ are unlike fractions.

2.Solution:

(i) $\frac{5}{6}$ and $\frac{7}{9}$

Here the LCM of 6 and 9 is 18

$$\frac{5}{6} = \frac{(5 \times 3)}{(6 \times 3)} = \frac{15}{18}$$

$$\frac{7}{9} = \frac{(7 \times 2)}{(9 \times 2)} = \frac{14}{18}$$

Therefore, $\frac{15}{18}$ and $\frac{14}{18}$ are the required fractions.

(ii) $\frac{2}{3}$, $\frac{5}{6}$ and $\frac{7}{12}$

Here the LCM of 3, 6 and 12 is 12

$$\frac{2}{3} = \frac{(2 \times 4)}{(3 \times 4)} = \frac{8}{12}$$

$$\frac{5}{6} = \frac{(5 \times 2)}{(6 \times 2)} = \frac{10}{12}$$

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

Therefore, $\frac{8}{12}$, $\frac{10}{12}$ and $\frac{7}{12}$ are the required fractions.

(iii) $\frac{4}{5}$, $\frac{17}{20}$, $\frac{23}{40}$ and $\frac{11}{16}$

Here the LCM of 5, 20, 40 and 16 is 80

$$\frac{4}{5} = \frac{(4 \times 16)}{(5 \times 16)} = \frac{64}{80}$$

$$\frac{17}{20} = \frac{(17 \times 4)}{(20 \times 4)} = \frac{68}{80}$$

$$\frac{23}{40} = \frac{(23 \times 2)}{(40 \times 2)} = \frac{46}{80}$$

$$\frac{11}{16} = \frac{(11 \times 5)}{(16 \times 5)} = \frac{55}{80}$$

Therefore, $\frac{64}{80}$, $\frac{68}{80}$, $\frac{46}{80}$ and $\frac{55}{80}$ are the required fractions.

3. i) $\frac{8}{9}$ and $\frac{12}{17}$

Here the LCM of 8 and 12 is 24

$$\frac{8}{9} = \frac{(8 \times 3)}{(9 \times 3)} = \frac{24}{27}$$

$$\frac{12}{17} = \frac{(12 \times 2)}{(17 \times 2)} = \frac{24}{34}$$

Therefore, $\frac{24}{27}$ and $\frac{24}{34}$ are the required fractions.

(ii) $\frac{6}{13}$, $\frac{15}{23}$ and $\frac{12}{17}$

Here the LCM of 6, 15 and 12 is 60

$$\frac{6}{13} = \frac{(6 \times 10)}{(13 \times 10)} = \frac{60}{130}$$

$$\frac{15}{23} = \frac{(15 \times 4)}{(23 \times 4)} = \frac{60}{92}$$

$$\frac{12}{17} = \frac{(12 \times 5)}{(17 \times 5)} = \frac{60}{85}$$

Therefore, $\frac{60}{130}$, $\frac{60}{92}$ and $\frac{60}{85}$ are the required fractions.

(iii) $\frac{15}{19}$, $\frac{25}{28}$, $\frac{9}{11}$ and $\frac{45}{47}$

Here the LCM of 15, 25, 9 and 45 is 225

$$\frac{15}{19} = \frac{(15 \times 15)}{(19 \times 15)} = \frac{225}{285}$$

$$\frac{25}{28} = \frac{(25 \times 9)}{(28 \times 9)} = \frac{225}{252}$$

$$\frac{9}{11} = \frac{(9 \times 25)}{(11 \times 25)} = \frac{225}{275}$$

$$\frac{45}{47} = \frac{(45 \times 5)}{(47 \times 5)} = \frac{225}{235}$$

Therefore, $\frac{225}{285}$, $\frac{225}{252}$, $\frac{225}{275}$ and $\frac{225}{235}$ are the required fractions.

4.(i) $\frac{1}{3}$, $\frac{2}{5}$, $\frac{3}{4}$ and $\frac{1}{6}$

Here the LCM of 3, 5, 4 and 6 is 60

$$\frac{1}{3} = (1 \times 20) / (3 \times 20) = 20/60$$

$$\frac{2}{5} = (2 \times 12) / (5 \times 12) = 24/60$$

$$\frac{3}{4} = (3 \times 15) / (4 \times 15) = 45/60$$

$$\frac{1}{6} = (1 \times 10) / (6 \times 10) = 10/60$$

So we get

$$10/60 < 20/60 < 24/60 < 45/60$$

It can be written as

$$\frac{1}{6} < \frac{1}{3} < \frac{2}{5} < \frac{3}{4}$$

Therefore, $\frac{1}{6}$, $\frac{1}{3}$, $\frac{2}{5}$ and $\frac{3}{4}$ are in ascending order.

(ii) $\frac{5}{6}$, $\frac{7}{8}$, $\frac{11}{12}$ and $\frac{3}{10}$

Here the LCM of 6, 8, 12 and 10 is 240

$$\frac{5}{6} = (5 \times 40) / (6 \times 40) = 200/240$$

$$\frac{7}{8} = (7 \times 30) / (8 \times 30) = 210/240$$

$$\frac{11}{12} = (11 \times 20) / (12 \times 20) = 220/240$$

$$\frac{3}{10} = (3 \times 24) / (10 \times 24) = 72/240$$

So we get

$$72/240 < 200/240 < 210/240 < 220/240$$

It can be written as

$$\frac{3}{10} < \frac{5}{6} < \frac{7}{8} < \frac{11}{12}$$

Therefore, $\frac{3}{10}$, $\frac{5}{6}$, $\frac{7}{8}$ and $\frac{11}{12}$ are in ascending order.

5. Solution:

(i) $5/6$, $4/15$, $8/9$ and $1/3$

Here the LCM of 5, 4, 8 and 1 is 40

$$5/6 = (5 \times 8) / (6 \times 8) = 40/48$$

$$4/15 = (4 \times 10) / (15 \times 10) = 40/150$$

$$8/9 = (8 \times 5) / (9 \times 5) = 40/45$$

$$1/3 = (1 \times 40) / (3 \times 40) = 40/120$$

So we get

$$40/45 > 40/48 > 40/120 > 40/150$$

It can be written as

$$8/9 > 5/6 > 1/3 > 4/15$$

Therefore, $8/9$, $5/6$, $1/3$ and $4/15$ are in descending order.

(ii) $3/7$, $4/9$, $5/7$ and $8/11$

Here the LCM of 3, 4, 5 and 8 is 120

$$3/7 = (3 \times 40) / (7 \times 40) = 120/280$$

$$4/9 = (4 \times 30) / (9 \times 30) = 120/270$$

$$5/7 = (5 \times 24) / (7 \times 24) = 120/168$$

$$8/11 = (8 \times 15) / (11 \times 15) = 120/165$$

So we get

$$120/165 > 120/168 > 120/270 > 120/280$$

It can be written as

$$8/11 > 5/7 > 4/9 > 3/7$$

Therefore, $8/11$, $5/7$, $4/9$ and $3/7$ are in descending order.

6. Find the greater fraction:

(i) $\frac{3}{5}$ and $\frac{11}{15}$

(ii) $\frac{4}{5}$ and $\frac{3}{10}$

Solution:

(i) $\frac{3}{5}$ and $\frac{11}{15}$

Here the LCM of 5 and 15 is 15

$$\frac{3}{5} = \frac{(3 \times 3)}{(5 \times 3)} = \frac{9}{15}$$

$$\frac{11}{15} = \frac{11}{15}$$

So we get, $\frac{11}{15} > \frac{9}{15}$

Therefore, $\frac{11}{15}$ is greater.

(ii) $\frac{4}{5}$ and $\frac{3}{10}$

Here the LCM of 5 and 10 is 10

$$\frac{4}{5} = \frac{(4 \times 2)}{(5 \times 2)} = \frac{8}{10}$$

$$\frac{3}{10} = \frac{3}{10}$$

So we get, $\frac{8}{10} > \frac{3}{10}$

$$\frac{4}{5} > \frac{3}{10}$$

Therefore, $\frac{4}{5}$ is greater.