

Class: 4

Subject : Mathematics

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Lecture 3 Solution

Chapter: Eight

Fractions (solution)

EXAMPLE 1: Reduce $\frac{16}{20}$.

Solution:

$$\frac{16}{20} \xrightarrow{\div 2} \frac{8}{10} \xrightarrow{\div 2} \frac{4}{5}$$

Ans: $\frac{4}{5}$

Example 2: Reduce the following fractions to the lowest term.

Solution:

(1) $\frac{4}{10} \xrightarrow{\div 2} \frac{2}{5}$

Ans: $\frac{2}{5}$

(2) $\frac{12}{15} \xrightarrow{\div 3} \frac{4}{5}$

Ans: $\frac{4}{5}$

(3) $\frac{9}{27} \xrightarrow{\div 3} \frac{3}{9} \xrightarrow{\div 3} \frac{1}{3}$

Ans: $\frac{1}{3}$

(4) $\frac{24}{36} \xrightarrow{\div 2} \frac{12}{18} \xrightarrow{\div 3} \frac{4}{6} \xrightarrow{\div 2} \frac{2}{3}$

Ans: $\frac{2}{3}$

(5) $\frac{28}{42} \xrightarrow{\div 2} \frac{14}{21} \xrightarrow{\div 7} \frac{2}{3}$

Ans: $\frac{2}{3}$

(6) $\frac{40}{60} \xrightarrow{\div 2} \frac{20}{30} \xrightarrow{\div 2} \frac{10}{15} \xrightarrow{\div 5} \frac{2}{3}$

Ans: $\frac{2}{3}$

Exercise (1)

4. Reduce the following fractions to the lowest term.

Solution:

$$(1) \frac{6}{12} \stackrel{+2}{\div} \frac{2}{6} \stackrel{+2}{\div} \frac{1}{3} \quad (2) \frac{3}{21} \stackrel{+3}{\div} \frac{1}{7} \quad (3) \frac{9}{36} \stackrel{+3}{\div} \frac{3}{12} \stackrel{+3}{\div} \frac{1}{4}$$

Ans: $\frac{1}{3}$ **Ans:** $\frac{1}{7}$ **Ans:** $\frac{1}{4}$

$$(4) \frac{16}{48} \stackrel{+2}{\div} \frac{8}{24} \stackrel{+2}{\div} \frac{4}{12} \stackrel{+2}{\div} \frac{2}{6} \stackrel{+2}{\div} \frac{1}{3} \quad (5) \frac{8}{12} \stackrel{+2}{\div} \frac{4}{6} \stackrel{+2}{\div} \frac{2}{3}$$

Ans: $\frac{4}{7}$ **Ans:** $\frac{2}{3}$

$$(6) \frac{9}{12} \stackrel{+3}{\div} \frac{3}{4} \quad (7) \frac{20}{25} \stackrel{+5}{\div} \frac{4}{5} \quad (8) \frac{32}{36} \stackrel{+2}{\div} \frac{16}{18} \stackrel{+2}{\div} \frac{8}{9}$$

Ans: $\frac{3}{4}$ **Ans:** $\frac{4}{5}$ **Ans:** $\frac{8}{9}$

$$(9) \frac{18}{30} \stackrel{+2}{\div} \frac{9}{15} \stackrel{+3}{\div} \frac{3}{5} \quad (10) \frac{16}{28} \stackrel{+2}{\div} \frac{8}{14} \stackrel{+2}{\div} \frac{4}{7}$$

Ans: $\frac{3}{5}$ **Ans:** $\frac{4}{7}$

$$(11) \frac{28}{49} \stackrel{+7}{\div} \frac{4}{7} \quad (12) \frac{24}{40} \stackrel{+2}{\div} \frac{12}{20} \stackrel{+2}{\div} \frac{6}{10} \stackrel{+2}{\div} \frac{3}{5}$$

Ans: $\frac{4}{7}$ **Ans:** $\frac{3}{5}$

Example 1: Convert into fractions with common denominators.

Solution:

(1) **Solution:** $\left[\frac{1}{3}, \frac{1}{4}\right]$

L.c.m of 3 and 4 is 12 .

For 1st fraction, $12 \div 3 = 4$

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

Again,

For 2nd fraction, $12 \div 4 = 3$

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

Ans: $\left[\frac{1}{3}, \frac{1}{4}\right] \rightarrow \left[\frac{4}{12}, \frac{3}{12}\right]$

(2) **Solution:** $\left[\frac{2}{3}, \frac{1}{2}\right]$

L.c.m of 3 and 2 is 6.

For 1st fraction, $6 \div 3 = 2$

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

Again,

For 2nd fraction, $6 \div 2 = 3$

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

Ans: $\left[\frac{2}{3}, \frac{1}{2}\right] \rightarrow \left[\frac{4}{6}, \frac{3}{6}\right]$

(3) **Solution:** $\left[\frac{1}{2}, \frac{2}{5}\right]$

L.c.m of 2 and 5 is 10 .

For 1st fraction, $10 \div 2 = 5$

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

Again,

For 2nd fraction, $10 \div 5 = 2$

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

Ans:

$\left[\frac{1}{2}, \frac{2}{5}\right] \rightarrow \left[\frac{5}{10}, \frac{4}{10}\right]$

(4) **Solution:** $\left[\frac{1}{3}, \frac{2}{5}\right]$

L.c.m of 3 and 5 is 15.

For 1st fraction, $15 \div 3 = 5$

$$\frac{1}{3} = \frac{1 \times 5}{3 \times 5} = \frac{5}{15}$$

Again,

For 2nd fraction, $15 \div 5 = 3$

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

Ans:

$\left[\frac{1}{3}, \frac{2}{5}\right] \rightarrow \left[\frac{5}{15}, \frac{6}{15}\right]$

(5) **Solution:** $\left[\frac{1}{2}, \frac{1}{4}\right]$

L.c.m of 2 and 4 is 4 .

For 1st fraction, $4 \div 2 = 2$

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

Again,

For 2nd fraction, $4 \div 4 = 1$

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

Ans: $\left[\frac{1}{2}, \frac{1}{4}\right] \rightarrow \left[\frac{2}{4}, \frac{1}{4}\right]$

(7) **Solution:** $\left[\frac{7}{9}, \frac{5}{12}\right]$

L.c.m of 9 and 12 is 36 .

For 1st fraction, $36 \div 9 = 4$

$$\frac{7 \times 4}{9 \times 4} = \frac{28}{36}$$

Again,

For 2nd fraction, $36 \div 12 = 3$

$$\frac{5}{12} = \frac{5 \times 3}{12 \times 3} = \frac{15}{36}$$

Ans: $\left[\frac{7}{9}, \frac{5}{12}\right] \rightarrow \left[\frac{28}{36}, \frac{15}{36}\right]$

(8) **Solution:** $\left[\frac{1}{3}, \frac{1}{4}, \frac{1}{2}\right]$

L.c.m of 3,4 and 2 is 12.

For 1st fraction, $12 \div 3 = 4$

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

For 2nd fraction, $12 \div 4 = 3$

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

For 3rd fraction, $12 \div 2 = 6$

(6) **Solution:** $\left[\frac{3}{4}, \frac{5}{6}\right]$

L.c.m of 4 and 6 is 12

For 1st fraction, $12 \div 4 = 3$

$$\frac{3}{4} = \frac{3 \times 3}{4 \times 3} = \frac{9}{12}$$

Again,

For 2nd fraction, $12 \div 6 = 2$

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

Ans: $\left[\frac{3}{4}, \frac{5}{6}\right] \rightarrow \left[\frac{9}{12}, \frac{10}{12}\right]$

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

$$\text{Ans: } \left[\frac{1}{3}, \frac{1}{4}, \frac{1}{2} \right] \rightarrow \left[\frac{4}{12}, \frac{3}{12}, \frac{6}{12} \right]$$

(9) **Solution:** $\left[\frac{1}{2}, \frac{2}{3}, \frac{1}{5} \right]$

L.c.m of 2,3 and 5 is 30.

For 1st fraction, $30 \div 2 = 15$

$$\frac{1}{2} = \frac{1 \times 15}{2 \times 15} = \frac{15}{30}$$

For 2nd fraction, $30 \div 3 = 10$

$$\frac{2}{3} = \frac{2 \times 10}{3 \times 10} = \frac{20}{30}$$

For 3rd fraction, $30 \div 5 = 6$

$$\frac{1}{5} = \frac{1 \times 6}{5 \times 6} = \frac{6}{30}$$

$$\text{Ans: } \left[\frac{1}{2}, \frac{2}{3}, \frac{1}{5} \right] \rightarrow \left[\frac{15}{30}, \frac{20}{30}, \frac{6}{30} \right]$$

(10) **Solution:** $\left[\frac{3}{5}, \frac{3}{4}, \frac{7}{10} \right]$

L.c.m of 5,4 and 10 is 20.

For 1st fraction, $20 \div 5 = 4$

$$\frac{3}{5} = \frac{3 \times 4}{5 \times 4} = \frac{12}{20}$$

For 2nd fraction, $20 \div 4 = 5$

$$\frac{3}{4} = \frac{3 \times 5}{4 \times 5} = \frac{15}{20}$$

For 3rd fraction, $20 \div 10 = 2$

$$\frac{7}{10} = \frac{7 \times 2}{10 \times 2} = \frac{14}{20}$$

$$\text{Ans: } \left[\frac{3}{5}, \frac{3}{4}, \frac{7}{10} \right] \rightarrow \left[\frac{12}{20}, \frac{15}{20}, \frac{14}{20} \right]$$

Example 2: Convert into fractions with common denominators and compare with the symbols “<” or “>” or “=”.

Solution:

$$(1) \frac{7}{9} \boxed{>} \frac{5}{12} \quad (2) \frac{3}{4} \boxed{<} \frac{5}{7} \quad (3) \frac{2}{3} \boxed{=} \frac{6}{9} \quad (4) \frac{11}{16} \boxed{<} \frac{17}{24}$$

Exercise (2)

1. Convert into fractions with common denominators and compare with the symbols “<” or “>” or “=”.

Solution:

$$(1) \frac{1}{3} \boxed{>} \frac{1}{5} \quad (2) \frac{3}{4} \boxed{<} \frac{5}{6} \quad (3) \frac{5}{7} \boxed{>} \frac{6}{9} \quad (4) \frac{3}{4} \boxed{=} \frac{12}{16} \quad (5) \frac{3}{24} \boxed{>} \frac{7}{72}$$