

Girls' High School & College, Prayagraj

Worksheet- 3

Session- 2020-2021

Class –VII (A, B, C, D, E, F)

Subject – Mathematics

Chapter – Fraction

Instructions: Parents are expected to ensure that the child refers the chapter of the previous class or the internet

Website: www.wikipedia.com

Read the given points carefully and then answer the following questions:

1. Proper Fraction: A fraction, whose numerator is less than its denominator, is called a proper fraction E.g. $\frac{3}{5}$, $\frac{4}{6}$ etc.
2. Improper Fraction: A fraction, whose numerator is greater than or equal to its denominator, is called an improper fraction E.g. $\frac{8}{6}$, $\frac{24}{13}$ etc.
3. Mixed Fraction: A mixed fraction consists of two parts: (i) an integer and (ii) a proper fraction E.g. $5\frac{2}{3}$ is a mixed fraction.

Q 1. From the following fractions, separate:

- (i) Proper fractions
- (ii) Improper fractions
- (iii) Mixed fractions

$$\frac{2}{9}, 2\frac{4}{9}, \frac{4}{3}, \frac{7}{15}, 7\frac{5}{13}, \frac{11}{20}.$$

To convert the mixed fractions to improper fractions:

$$\text{e.g. } 2\frac{1}{5} = \frac{2 \times 5 + 1}{5} = \frac{10 + 1}{5} = \frac{11}{5}$$

$$\text{e.g. } 4\frac{2}{5} = \frac{4 \times 5 + 2}{5} = \frac{20 + 2}{5} = \frac{22}{5}$$

Q 2. Change the following mixed fractions to improper fractions.

$$(i) 3\frac{1}{4} \quad (ii) 7\frac{1}{8} \quad (iii) 2\frac{1}{11} \quad (iv) 4\frac{3}{5} \quad (v) 2\frac{4}{9} \quad (vi) 3\frac{1}{4}$$

To convert the improper fractions to mixed fractions:

$$\text{e.g. } \frac{100}{17} = 5\frac{5}{17}$$

e.g. $\frac{18}{5} = 3\frac{3}{5}$

Q 3. Change the following improper fractions to mixed fractions:

(i) $\frac{81}{11}$ (ii) $\frac{209}{7}$ (iii) $\frac{113}{15}$ (iv) $\frac{41}{13}$ (v) $\frac{7}{4}$ (vi) $\frac{25}{6}$

Reduce to lowest terms:

Divide the numerator and denominator with highest common factor:

e.g. $\frac{8}{10} = \frac{8 \div 2}{10 \div 2} = \frac{4}{5}$

e.g. $\frac{28}{35} = \frac{28 \div 7}{35 \div 7} = \frac{4}{5}$

Q 4. Reduce the given fractions to their lowest terms:

(i) $\frac{50}{75}$ (ii) $\frac{105}{70}$ (iii) $\frac{48}{60}$ (iv) $\frac{18}{27}$ (v) $\frac{18}{82}$ (vi) $\frac{35}{75}$

Equivalent (Equal) fractions:

Fractions having the same value are called equivalent fractions.

e.g. $\frac{20}{25}$ and $\frac{28}{35}$ are equivalent fractions.

Since $\frac{20}{25} = \frac{20 \div 5}{25 \div 5} = \frac{4}{5}$

and $\frac{28}{35} = \frac{28 \div 7}{35 \div 7} = \frac{4}{5}$

\therefore Fractions $\frac{20}{25}$ and $\frac{28}{35}$ are equivalent.

i.e. $\frac{20}{25} = \frac{28}{35} = \frac{4}{5}$ are equivalent.

e.g. Are $\frac{6}{10}$, $\frac{9}{15}$, $\frac{12}{20}$ and $\frac{20}{25}$ equivalent fractions?

Since $\frac{6}{10} = \frac{6 \div 2}{10 \div 2} = \frac{3}{5}$,

$\frac{9}{15} = \frac{9 \div 3}{15 \div 3} = \frac{3}{5}$,

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

and $\frac{20}{25} = \frac{20 \div 5}{25 \div 5} = \frac{4}{5}$

∴ Fractions $\frac{6}{10}, \frac{9}{15}, \frac{12}{20}$ and $\frac{20}{25}$ are not equivalent.

i.e. $\frac{6}{10}, \frac{9}{15}, \frac{12}{20}$ and $\frac{20}{25}$ are not equivalent.

Q 5. State True or False:

(i) $\frac{30}{40}$ and $\frac{12}{16}$ are equivalent fractions.

(ii) $\frac{10}{25}$ and $\frac{25}{10}$ are equivalent fractions.

(iii) $\frac{35}{44}, \frac{20}{28}, \frac{45}{63}$, and $\frac{100}{140}$ are equivalent fractions.

Comparison of fractions:

e.g. $\frac{2}{3}, \frac{3}{4}, \frac{5}{12}$ and $\frac{9}{16}$.

∴ L.C.M. of the denominator 3, 4, 12 and 16 = 48

$$\begin{aligned} \therefore \frac{2}{3} &= \frac{2 \times 16}{3 \times 16} = \frac{32}{48}, & \frac{3}{4} &= \frac{3 \times 12}{4 \times 12} = \frac{36}{48}, \\ \frac{5}{12} &= \frac{5 \times 4}{12 \times 4} = \frac{20}{48} & \text{and} & \frac{9}{16} = \frac{9 \times 3}{16 \times 3} = \frac{27}{48} \end{aligned} \quad \left. \begin{array}{l} \text{Convert} \\ \text{into like} \\ \text{fractions} \end{array} \right\}$$

Since, the biggest numerator is 36, thus the biggest fraction is $\frac{36}{48}$ (i.e. $\frac{3}{4}$).

Next one is $\frac{32}{48}$ (i.e. $\frac{2}{3}$),

$\frac{27}{48}$ (i.e. $\frac{9}{16}$) and

Smallest fraction is $\frac{20}{48}$ (i.e. $\frac{5}{12}$).

∴ Fractions in ascending order are $\frac{5}{12}, \frac{9}{16}, \frac{2}{3}$ and $\frac{3}{4}$.

i.e. $\frac{5}{12} < \frac{9}{16} < \frac{2}{3} < \frac{3}{4}$.

And fractions in descending order are $\frac{3}{4}, \frac{2}{3}, \frac{9}{16}$ and $\frac{5}{12}$.

i.e. $\frac{3}{4} > \frac{2}{3} > \frac{9}{16} > \frac{5}{12}$.

e.g. $\frac{5}{6}, \frac{7}{8}, \frac{11}{12}$ and $\frac{3}{10}$.

∴ L.C.M. of the denominator 6, 8, 12 and 10

$$\begin{array}{r|l}
 2 & 6, 8, 12, 10 \\
 \hline
 2 & 3, 4, 6, 5 \\
 \hline
 2 & 3, 2, 3, 5 \\
 \hline
 3 & 3, 1, 3, 5 \\
 \hline
 5 & 1, 1, 1, 5 \\
 \hline
 & 1, 1, 1, 1
 \end{array}$$

$$= 2 \times 2 \times 2 \times 3 \times 5$$

$$= 120$$

$$\therefore \frac{5}{6} = \frac{5 \times 20}{6 \times 20} = \frac{100}{120}, \quad \frac{7}{8} = \frac{7 \times 15}{8 \times 15} = \frac{105}{120},$$

$$\frac{11}{12} = \frac{11 \times 10}{12 \times 10} = \frac{110}{120} \quad \text{and} \quad \frac{3}{10} = \frac{3 \times 12}{10 \times 12} = \frac{36}{120}$$

Since, the biggest numerator is 110, thus the biggest fraction is $\frac{110}{120}$ (i.e. $\frac{11}{12}$).

Next one is $\frac{105}{120}$ (i.e. $\frac{7}{8}$),

$\frac{100}{120}$ (i.e. $\frac{5}{6}$) and

Smallest fraction is $\frac{36}{120}$ (i.e. $\frac{3}{10}$).

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

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

And fractions in descending order are $\frac{11}{12}, \frac{7}{8}, \frac{5}{6}$ and $\frac{3}{10}$.

i.e. $\frac{11}{12} > \frac{7}{8} > \frac{5}{6} > \frac{3}{10}$.

Q 6. Compare the fractions:

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

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

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

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

Insert one fraction between:

e.g. $\frac{1}{2}$ and $\frac{3}{5}$

A fraction between $\frac{1}{2}$ and $\frac{3}{5} = \frac{1+3}{2+5} = \frac{4}{7}$.

Hence, one fraction between $\frac{1}{2}$ and $\frac{3}{5}$ will be $\frac{4}{7}$.

Insert two fractions between:

e.g. 1 and $\frac{3}{11} = \frac{1+3}{1+11}$
 $= \frac{4}{12}$
 $= \frac{1}{3}$

A fraction between $\frac{1}{3}$ and $\frac{3}{11} = \frac{1+3}{3+11} = \frac{4}{14} = \frac{2}{7}$

Hence, two fractions between 1 and $\frac{3}{11}$ will be $\frac{1}{3}$ and $\frac{2}{7}$.

Insert three fractions between:

e.g. $\frac{1}{2}$ and $\frac{3}{5}$

A fraction between $\frac{1}{2}$ and $\frac{3}{5} = \frac{1+3}{2+5} = \frac{4}{7}$

Now, a fraction between $\frac{1}{2}$ and $\frac{4}{7}$
 $= \frac{1+4}{2+7} = \frac{5}{9}$

And a fraction between $\frac{4}{7}$ and $\frac{3}{5}$
 $= \frac{4+3}{7+5} = \frac{7}{12}$

Hence, three fractions between $\frac{1}{2}$ and $\frac{3}{5}$ will be $\frac{4}{7}$, $\frac{5}{9}$ and $\frac{7}{12}$.

Q 7(a). Insert one fraction between:

(i) $\frac{3}{7}$ and $\frac{4}{9}$.

(ii) 2 and $\frac{8}{3}$.

Q 7(b). Insert two fractions between:

(i) $\frac{5}{9}$ and $\frac{1}{4}$.

(ii) $\frac{5}{6}$ and $1\frac{1}{5}$.

Q 7(c). Insert three fractions between:

- (i) $\frac{2}{5}$ and $\frac{4}{9}$.
 (ii) $\frac{1}{2}$ and $\frac{5}{7}$.

Addition of fractions:

e.g. $1\frac{3}{4}$ and $\frac{3}{8} = \frac{7}{4} + \frac{3}{8}$

L.C.M. of 4 and 8 = 8

$$= \frac{14+3}{8}$$

$$= \frac{17}{8} = 2\frac{1}{8}$$

e.g. $2\frac{1}{2} + \frac{1}{3} + 1\frac{1}{4}$

$$= \frac{5}{2} + \frac{1}{3} + \frac{5}{4}$$

L.C.M. of 2, 3, 4 = 12

$$= \frac{30+4+15}{12} = \frac{49}{12} = 4\frac{1}{12}$$

Q 8. Add the following fractions:

(i) $\frac{2}{5}$ and $2\frac{3}{15}$.

(ii) $1\frac{7}{8}$ and $1\frac{1}{2}$.

(iii) $2\frac{1}{6}$ and $1\frac{5}{8}$.

(iv) $2\frac{8}{9}$, $\frac{11}{18}$ and $3\frac{5}{6}$.

Subtraction of fractions:

e.g. $\frac{9}{10} - \frac{5}{6}$

L.C.M. of 10 and 6 = 60

$$= \frac{54-50}{60}$$

$$= \frac{4}{60} = \frac{1}{15}$$

e.g. $2\frac{6}{7} - 1\frac{2}{5}$

$$= \frac{20}{7} - \frac{7}{5}$$

L.C.M. of 7 and 5 = 35

$$= \frac{100-49}{35}$$

$$= \frac{51}{35} = 1\frac{16}{35}$$

Q 9. Subtract the following fractions:

(i) 2 from $\frac{2}{3}$.

(ii) $\frac{2}{9}$ from $\frac{4}{5}$.

(iii) $\frac{9}{11} - \frac{2}{15}$.

(iv) $8\frac{1}{2} - 3\frac{5}{8}$.

END