

GIRLS' HIGH SCHOOL & COLLEGE, PRAYAGRAJ

SESSION-2020-21

CLASS-6 (A,B,C,D,E & F)

SUBJECT-MATHEMATICS

WORKSHEET-4

Note - Parents are requested to help the child understand the examples given below and then solve the questions. The child can also refer to the link given below.

(<https://www.ncertbooks.guru/selina-concise-mathematics-class-6-icse-solutions-chapter-14/>)

Examples:

1. Fraction = Numerator/ Denominator e.g. $7/11$ is a fraction with numerator 7 and denominator 11.
2. A fraction whose numerator is less than its denominator is called a proper fraction .
e.g. $4/7$, $9/14$
A fraction whose numerator is greater than or equal to its denominator is called an improper fraction . e.g. $25/12$, $5/5$
3. A mixed fraction consists of an integer and a proper fraction e.g. $4\frac{2}{3}$ is a mixed fraction.
4. To convert mixed fraction into an improper fraction- Multiply the integral part by the denominator and add the numerator to the product.
e.g. $5\frac{3}{4} = \frac{5 \times 4 + 3}{4} = \frac{23}{4}$
5. To convert an improper fraction into a mixed fraction - Divide the numerator by the denominator. The quotient of this division is the integral part and the remainder obtained is the numerator of the required mixed fraction.
e.g. $23/4 = \text{Quotient } \frac{\text{Remainder}}{\text{Denominator}} = 5\frac{3}{4}$
6. Two or more fractions with the same denominator but different numerators are called like fractions.
e.g. $3/5$, $1/5$, $2/5$

Two or more fractions with different denominators are called unlike fractions.
e.g. $5/9, 7/8, 3/4$
7. Converting unlike fractions into like fractions-
Steps:
 - 1) Find the L.C.M. of the denominators of all the given fractions .
 - 2) Multiply the numerator and the denominator of each fraction by a same suitable number so that the denominator of each fraction becomes equal to the L.C.M. obtained in step (1)

Convert $\frac{3}{7}$, $\frac{4}{5}$ and $\frac{1}{3}$ into like fractions

Solution:

L.C.M. of the denominators 7, 5 and 3 = 105

$$\text{Now } \frac{3}{7} = \frac{3 \times 15}{7 \times 15} = \frac{45}{105}$$

$$\frac{4}{5} = \frac{4 \times 21}{5 \times 21} = \frac{84}{105}$$

$$\frac{1}{3} = \frac{1 \times 35}{3 \times 35} = \frac{35}{105}$$

So, $\frac{3}{7}, \frac{4}{5}$ and $\frac{1}{3} = \frac{45}{105}, \frac{84}{105}$ and $\frac{35}{105}$ respectively.

8. If two or more fractions have the same value, they are called equivalent or equal fractions.

$$\frac{1}{3} = \frac{3}{9} = \frac{6}{18} = \frac{9}{27}$$

9. To reduce a given fraction to its lowest term:

i) find the H.C.F. of its numerator and denominator.

ii) divide each term of the fraction by the H.C.F. obtained in step i)

$$\frac{48}{60} = \frac{48 \div 12}{60 \div 12} = \frac{4}{5}$$

10. Comparing fractions:

Which fraction is greater ?

$\frac{3}{8}$ or $\frac{5}{12}$

Solution:

Step i) Convert the given fractions to like fractions.

Step ii) The fraction with greater numerator is greater

Since the L.C.M. of the denominators 8 and 12 = 24

So, $\frac{3}{8} = \frac{3 \times 3}{8 \times 3} = \frac{9}{24}$ and

$$\frac{5}{12} = \frac{5 \times 2}{12 \times 2} = \frac{10}{24}$$

The numerator 10 is greater

So, $\frac{10}{24}$ i.e. $\frac{5}{12}$ is greater

11. Addition of fractions:

$$\begin{aligned} & 3/4 + 2/5 \\ & = 3 \times 5 / 4 \times 5 + 2 \times 4 / 5 \times 4 \quad (\text{L.C.M. of 4 and 5 is 20}) \\ & = 15/20 + 8/20 = 23/20 = 1 \frac{3}{20} \end{aligned}$$

12. Subtraction of fractions :

$$\begin{aligned} & 1 \frac{5}{7} - 5/6 \\ & = 12/7 - 5/6 \\ & = 12 \times 6 / 7 \times 6 - 5 \times 7 / 6 \times 7 \\ & = 72/42 - 35/42 = \frac{72 - 35}{42} = \frac{37}{42} \end{aligned}$$

13. Multiplication of fractions:

$$\begin{aligned} & 3/4 \times 5 \\ & = 3/4 \times 5/1 = 3 \times 5 / 4 \times 1 = 15/4 = 3 \frac{3}{4} \end{aligned}$$

14. Division of fractions:

Multiply the dividend (the first fraction) by the reciprocal of the divisor (the second fraction)

$$2/3 \div 3/5 = 2/3 \times 5/3 = 10/9 = 1 \frac{1}{9}$$

15. Combined operations:

$$\begin{aligned} & 3/8 \div 4/7 \times 1/2 \\ & \text{Reciprocal of } 4/7 \text{ is } 7/4 \\ & 3/8 \div 4/7 = 3/8 \times 7/4 = 21/32 \\ & 3/8 \div 4/7 \times 1/2 = 21/32 \times 1/2 = \frac{21 \times 1}{32 \times 2} = 21/64 \end{aligned}$$

16. Using 'BODMAS'

B stands for 'BRACKET'
O stands for 'OF'
D stands for 'DIVISION'
M stands for 'MULTIPLICATION'
A stands for 'ADDITION'
S stands for 'SUBTRACTION'

While simplifying an expression involving three or more operations, the order of operations must be the same as in the order of letters used in 'BODMAS'

$$1 \frac{1}{2} \times \frac{1}{12} \div \frac{5}{4}$$

Using BODMAS division is done first

$$\frac{3}{2} \times \frac{1}{12} \times \frac{4}{5}$$

$$= \frac{3 \times 1 \times 4}{2 \times 12 \times 5} = \frac{1}{10}$$

17. Using BODMAS:

$$\frac{1}{3} + \frac{7}{9} \div \left(\frac{7}{10} \times 1 \frac{1}{4} \right)$$

$$= \frac{1}{3} + \frac{7}{9} \div \left(\frac{7}{10} \times \frac{5}{4} \right)$$

$$= \frac{1}{3} + \frac{7}{9} \div \frac{7}{8}$$

$$\left[\frac{7}{10} \times \frac{5}{4} = \frac{7 \times 5}{10 \times 4} = \frac{7}{8} \right]$$

$$= \frac{1}{3} + \frac{7}{9} \times \frac{8}{7}$$

$$= \frac{1}{3} + \frac{8}{9} = \frac{3+8}{9} = \frac{11}{9} = 1 \frac{2}{9}$$

Solve the following questions :

Q1) For the expression, write a fraction:

a) 2 out of 17 = _____

Q2) From the following fractions ,separate proper and improper fractions:

$\frac{4}{3}$, $\frac{11}{20}$, $\frac{18}{23}$, $\frac{35}{27}$

Q3) Change the following mixed fractions to improper fractions:

a) $2 \frac{1}{5}$ b) $3 \frac{1}{4}$

Q4) Change the following improper fractions to mixed fractions:

a) $\frac{100}{17}$ b) $-\frac{209}{17}$ c) $\frac{81}{11}$

Q5) Change the following groups of fractions into like fractions:

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

Q6) Fill in the blanks-

- a) $\frac{8}{5}$ is a _____ fraction.
- b) The value of $5 \div -5 =$ _____
- c) $\frac{8}{24}$ and $\frac{8}{32}$ are not _____ fractions.

Q7) Reduce the given fractions to their lowest term :

- a) $\frac{40}{120}$ b) $\frac{105}{70}$

Q8) State whether true or false:

- a) $\frac{2}{5} = \frac{10}{15}$ b) $\frac{35}{42} = \frac{5}{6}$

Q9) Which fraction is smaller?

$\frac{8}{15}$ or $\frac{4}{7}$

Q10) Insert the symbols = , < , or > between each pair of the fractions given below:

- a) $\frac{6}{11}$ ____ $\frac{5}{9}$
- b) $\frac{3}{7}$ ____ $\frac{9}{13}$
- c) $\frac{56}{64}$ ____ $\frac{7}{8}$

Q11) Add the following fractions:

- a) $1\frac{3}{4}$ and $\frac{3}{8}$
- b) $\frac{2}{5}$, $2\frac{3}{15}$ and $\frac{7}{10}$

Q12) Subtract the following fractions:

- a) $1\frac{11}{12} - 1\frac{3}{16}$
- b) $2\frac{3}{4} - 1\frac{5}{6}$

Q13) Simplify:

- a) $2\frac{5}{7} + \frac{3}{14} - \frac{13}{21}$
- b) $3\frac{5}{6} - \frac{1}{6} - 1\frac{1}{12}$
- c) $2\frac{3}{4} - 1\frac{5}{6}$
- d) $3\frac{1}{2} + 1\frac{2}{3} - 2\frac{1}{4}$
- e) $6 - 3\frac{1}{2} - 2\frac{1}{5}$

Q14) Simplify :

a) $\frac{3}{7} \times \frac{2}{5}$

b) $\frac{1}{2}$ of $\frac{1}{3} \times \frac{3}{4}$

Q 15) Solve:

a) $\frac{1}{2} \div (\frac{7}{8} - \frac{3}{5})$

b) $\frac{3}{4}$ of $6\frac{1}{8}$ - $\frac{2}{3}$ of $2\frac{1}{4}$

c) $2\frac{2}{3} \times 3\frac{1}{2} \div 2\frac{4}{9}$

Q 16) Simplify :

a) $1 \div \frac{2}{5}$

b) $4\frac{1}{2} \div \frac{4}{9}$

c) $2\frac{2}{3} \times 3\frac{1}{2} \div 4\frac{2}{9}$

Q 17) Simplify:

a) $2\frac{1}{4} \div \frac{2}{7}$ of $1\frac{1}{3} \times \frac{2}{3}$

b) $\frac{1}{3}$ of $60 \div 60$

c) $5 - (\frac{8}{11} - 3\frac{3}{11})$

d) $\frac{1}{2} \div (\frac{7}{8} - \frac{3}{5})$

e) $\frac{4}{7} \div (\frac{1}{3} \times 2\frac{4}{5})$

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