

MATHEMATICS

Class-VI

Topic-05

FRACTIONS



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TERMINOLOGIES

Fraction, proper fractions, improper fractions, mixed fractions, unit fractions, equivalent fractions, like and unlike fractions

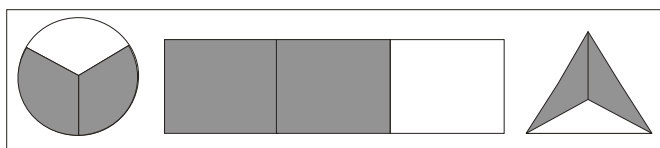
INTRODUCTION

Fractions indicate equal parts of a whole.

$\frac{1}{2}$ means that one whole thing is divided into 2 equal parts and one part out of these two parts is taken. Suppose we share one apple between two children, each child would get $\frac{1}{2}$ of the apple.

Let us examine what ideas a fraction $\frac{2}{3}$ may represent ?

(a) It may represent 2 out of 3 parts. The shaded part of each figure below represents $\frac{2}{3}$ of the entire



(b) It may represent 2 of 3 members in a group. 2 out of 3 fruits are bananas.

5.1 FRACTIONS

A fraction is a number representing a part of a whole. It is written as $\frac{a}{b}$ where a is the numerator and b is the denominator. We can also say that $\frac{a}{b} = a \div b$.

Examples of fractions are $\frac{2}{7}, \frac{5}{9}, \frac{6}{13}$ etc.

(a) Fraction as a part of a whole

If a pizza is divided into four equal parts, each part is represented as 1 part out of 4 equal parts and is written as $\frac{1}{4}$. The part that is considered (in this case, 1) is called the **numerator**. The number of parts into which the whole is divided (in this case, 4) is called the **denominator**.

Illustration 5.1

What fraction of a day is 9 hours?

Sol. One day = 24 hours

$$\therefore 9 \text{ hours out of } 24 = \frac{9}{24}$$

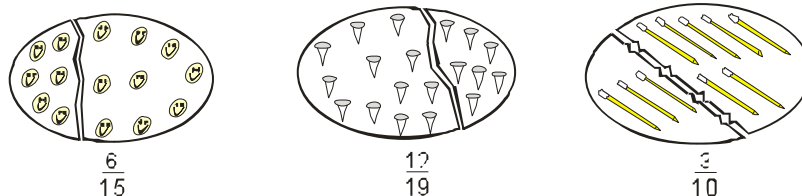
i.e., 9 hours out of 24 hours. Hence, 9 hours is $\frac{9}{24}$ parts of a day.

NOTE:

Since time is in hours, so it is necessary to convert the two quantities, day and time in the same unit.

(b) Fraction as a part of a collection

Now study the following collections of similar things. Some things in each collection are separated. The given fraction of the whole collection represented the things separated the left in the collection.



The fraction $\frac{6}{15}$ indicates that the collection has 15 objects of which 6 are separated (taken)

(c) Fraction as a division

A fraction can be used to represent a division sum. For example, if one pastry has to be shared equally between two friends, the corresponding division sum would be $1 \div 2$. We can represent this in fraction as $\frac{1}{2}$. Hence, we would say that pastry shared by each friend is $\frac{1}{2}$ of the pastry.

While expressing a division sum as a fraction, the dividend is written as the numerator and the divisor is written as the denominator. Similarly, a fraction can be represented as a division sum. In that case, the numerator is written as the dividend and the denominator as the divisor.

(d) Fraction in lowest form

A fraction is said to be in its lowest term if the only common factor between the numerator and the denominator of the fraction is 1, i.e., when the numerator and denominator are co-prime. It is also known as the simplest form or the standard form of a fraction.

For example, $\frac{3}{5}$ is a fraction in its lowest term.

A fraction can be reduced to its lowest term by following the steps given below.

1. Find the HCF of the numerator and the denominator.
2. Then divide both the numbers by the HCF.
3. The resultant fraction will be in its lowest term.

Illustration 5.2

Show that $\frac{7}{10}$ is in simplest form

Sol. Here, numerator = 7 and denominator = 10.
 Factors of 7 are 1, 7.
 Factors of 10 are 1, 2, 5, 10.
 Common factors of 7 and 10 is 1 only.
 \therefore HCF of 7 and 10 is 1.
 Hence, $\frac{7}{10}$ is in the simplest form.

Illustration 5.3

Reduce $\frac{24}{72}$ to its lowest term.

Sol. The HCF of 24 and 72 is 24. Divide both 24 and 72 by 24.
 $\frac{24}{72} = \frac{24 \div 24}{72 \div 24} = \frac{1}{3}$

Illustration 5.4

Reduce $\frac{27}{72}$ to its lowest terms.

Sol. In $\frac{27}{72}$, numerator = 27, denominator = 72.
 Prime factorising of each of them $27 = 3 \times 3 \times 3$ $72 = 3 \times 3 \times 2 \times 2 \times 2$
 \therefore HCF = $3 \times 3 = 9$ $\therefore \frac{27}{72} = \frac{27 \div 9}{72 \div 9} = \frac{3}{8}$
 Hence $\frac{27}{72}$ in its lowest term = $\frac{3}{8}$.

(e) Types of Fraction

(i) Proper Fractions : A proper fraction is a fraction in which the numerator is smaller than the denominator.

Examples of proper fractions are $\frac{2}{7}, \frac{5}{8}, \frac{12}{17}$, etc.

(ii) Improper Fractions : An improper fraction is a fraction in which the numerator is greater than the denominator.

$\frac{7}{2}, \frac{8}{5}, \frac{17}{12}$ are all improper fractions.

(iii) Mixed Fractions : A fraction like $\frac{7}{2}$ can also be expressed as $3\frac{1}{2}$, or $\frac{8}{5}$ can be written as $1\frac{3}{5}$. So, numbers of the form $3\frac{1}{2}, 1\frac{3}{5}$, etc., are called mixed numbers or mixed fractions.

(iv) Unit fractions : Any fraction with 1 as the numerator is called a unit fraction, Thus, $\frac{1}{3}$ is called a unit fraction.

(f) Representation on Number Line

(i) Representation of a Proper Fraction on a Number Line :

Draw a number line and mark points at equal intervals. Let these points represent the numbers 0, 1, 2,....

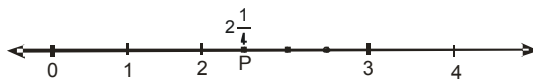
let us find a point on the number line corresponding to the fraction $\frac{2}{7}$. The denominator 7 suggests that the unit distance is to be divided into seven equal parts and 2 of these parts are to be taken . Thus the point P on the following number line represents the fraction $\frac{2}{7}$.



(ii) Representation of an Improper Fraction on a Number Line

Let us represent $2\frac{1}{4}$ on a number line.

Draw a number line and mark points at equal intervals. Let these points represent the numbers 0, 1, 2, 3,



We have learnt that $2\frac{1}{4} = 2 + \frac{1}{4}$ which shows that the number is greater than 2 but less than 3. So divide the distance between 2 and 3 in 4 equal parts (4 is the denominator of $\frac{1}{4}$). Each part represents $\frac{1}{4}$. The point P in the above figure represents the fraction $2\frac{1}{4}$.

(g) Like and Unlike Fractions

Two or more fractions with the same denominators are called like fractions, whereas fractions with different denominators are called unlike fractions.

For example,

$\frac{7}{20}, \frac{13}{20}, \frac{9}{20}, \frac{11}{20}$ are all like fractions as their denominators are all equal.

$\frac{3}{7}, \frac{8}{9}, \frac{3}{8}, \frac{6}{13}$ are all unlike fractions as their denominators are not equal.

(i) Conversion of unlike fractions into like fractions

It is easy to compare, add, and subtract like fractions, So, we must learn to convert unlike fractions to like fractions.

Illustration 5.5

Convert into like fractions $\frac{3}{8}, \frac{5}{6}, \frac{7}{12}$

Sol. Find the LCM of the denominators 8,6, and 12.

$$\text{LCM} = 2 \times 2 \times 2 \times 3 = 24$$

Now the above fractions can be converted into equivalent fractions with 24 as the denominator.

$$\begin{array}{r} 2 \overline{) 8, 6, 12} \\ 2 \overline{) 4, 3, 6} \\ 3 \overline{) 2, 3, 3} \\ 2, 1, 1 \end{array}$$

$$\frac{3}{8} = \frac{3 \times 3}{8 \times 3} = \frac{9}{24}, \frac{5}{6} = \frac{5 \times 4}{6 \times 4} = \frac{20}{24} \text{ and } \frac{7}{12} = \frac{7 \times 2}{12 \times 2} = \frac{14}{24}$$

So, $\frac{9}{24}$, $\frac{20}{24}$, and $\frac{14}{24}$ are like fractions representing $\frac{3}{8}$, $\frac{5}{6}$, and $\frac{7}{12}$, respectively.

(h) Conversion

(i) Conversion of Mixed Fractions into Improper Fractions

$$\text{Improper fraction} = \frac{(\text{Whole no.} \times \text{denominator}) + N}{\text{Denominator}}$$

where N = Numerator

(ii) Conversion of Improper Fractions into Mixed Fractions

Consider the improper fraction $\frac{29}{8}$.

On dividing 29 by 8, we get the quotient = 3 and the remainder = 5.

$$\therefore \frac{29}{8} = 3 + \frac{5}{8} = 3\frac{5}{8}$$

Illustration 5.6

Convert each of the following into an improper fraction :

(i) $3\frac{4}{5}$

(ii) $6\frac{5}{8}$

(iii) $5\frac{7}{9}$

Sol. We have :

(i) $3\frac{4}{5} = \frac{(3 \times 5) + 4}{5} = \frac{19}{5}$

(ii) $6\frac{5}{8} = \frac{(6 \times 8) + 5}{8} = \frac{53}{8}$

(iii) $5\frac{7}{9} = \frac{(5 \times 9) + 7}{9} = \frac{52}{9}$

Illustration 5.7

Convert each of the following into a mixed fraction :

(i) $\frac{23}{5}$

(ii) $\frac{37}{6}$

(iii) $\frac{45}{8}$

Sol. (i) $\frac{23}{5} = 4 + \frac{3}{5} = 4\frac{3}{5}$

(ii) $\frac{37}{6} = 6\frac{1}{6} = 6\frac{1}{6}$

(iii) $\frac{45}{8} = 5 + \frac{5}{8} = 5\frac{5}{8}$

(i) Equivalent Fractions

Consider the following fractions.

First one is $\frac{1}{2}$, second one is $\frac{2}{4}$, and the third one is $\frac{3}{6}$. Though written in different ways, they have the same value. Thus, fractions having equal value are called equivalent fractions.

There are two ways of obtaining equivalent fractions.

(a) By multiplying its numerator and denominator by the same number.

$$\frac{1}{2} = \frac{1 \times 2}{2 \times 2} = \frac{2}{4}, \quad \frac{1}{2} = \frac{1 \times 3}{2 \times 3} = \frac{3}{6}, \quad \frac{1}{2} = \frac{1 \times 4}{2 \times 4} = \frac{4}{8}$$

$\therefore \frac{1}{2}, \frac{2}{4}, \frac{3}{6}, \frac{4}{8}$ are all equivalent fractions.

(b) By dividing its numerator and denominator by the same number.

$$\frac{2}{4} = \frac{2 \div 2}{4 \div 2} = \frac{1}{2}, \quad \frac{3}{6} = \frac{3 \div 3}{6 \div 3} = \frac{1}{2}, \quad \frac{4}{8} = \frac{4 \div 4}{8 \div 4} = \frac{1}{2}$$

Illustration 5.8

Write four equivalent fractions of $\frac{4}{9}$.

Sol. Equivalent fractions of $\frac{4}{9}$ are :

$$\frac{4 \times 2}{9 \times 2} = \frac{8}{18}, \quad \frac{4 \times 3}{9 \times 3} = \frac{12}{27}, \quad \frac{4 \times 4}{9 \times 4} = \frac{16}{36}, \quad \frac{4 \times 5}{9 \times 5} = \frac{20}{45}$$

Ask yourself



1. Which of the following are in simplest form :

(a) $\frac{46}{64}$

(b) $\frac{13}{84}$

(c) $\frac{119}{126}$

(d) $\frac{27}{64}$

2. Classify as proper fractions , improper fractions , unit fractions :

(a) $\frac{4}{9}$

(b) $\frac{43}{7}$

(c) $\frac{3}{4}$

(d) $\frac{16}{16}$

3. Represent the following on number line :

(a) $\frac{2}{5}$

(b) $\frac{5}{11}$

(c) $\frac{5}{3}$

(d) $\frac{14}{6}$

4. Are $\frac{1}{20}, \frac{3}{20}, \frac{3}{21}, \frac{4}{20}$ are like or unlike fractions ?

5. Convert each of the following into a improper fractions :

(a) $7 \frac{3}{4}$

(b) $6 \frac{4}{9}$

(c) $11 \frac{11}{13}$

(d) $9 \frac{14}{17}$

6. Convert each of the following into a mixed numeral :

(a) $\frac{29}{4}$

(b) $\frac{63}{10}$

(c) $\frac{89}{7}$

(d) $\frac{101}{9}$

7. Write an equivalent fraction of :

(a) $\frac{2}{5}$ with numerator as 12

(b) $\frac{16}{40}$ with denominator as 10.

Answers

1. (b), (d)
2. (a) Proper (b) Improper (c) Proper (d) Unit
4. unlike fractions
5. (a) $\frac{31}{4}$ (b) $\frac{58}{9}$ (c) $\frac{154}{13}$ (d) $\frac{167}{17}$
6. (a) $6\frac{5}{4}$ (b) $6\frac{3}{10}$ (c) $12\frac{5}{7}$ (d) $11\frac{2}{9}$
7. (a) $\frac{12}{30}$ (b) $\frac{4}{10}$

5.2 COMPARISON OF FRACTIONS

(i) Compare two fractions $\frac{3}{7}$ and $\frac{5}{7}$. Since $5 > 3$

$$\therefore \frac{5}{7} > \frac{3}{7}$$

If the denominators of two given fractions are alike, the fraction with greater numerator is greater than the fraction with smaller numerator.

(ii) Compare two fractions $\frac{3}{5}$ and $\frac{3}{9}$. Since $5 < 9$. Clearly, $\frac{3}{5} > \frac{3}{9}$

If two different fractions with same numerators and unlike denominators are given, the fraction with smaller denominator is greater than the fraction with greater denominator.

(iii) Compare two fractions $\frac{7}{9}$ and $\frac{5}{12}$.

first we change $\frac{7}{9}$ and $\frac{5}{12}$ to equivalent fractions having like denominators. the L.C.M. of

9 and 12. = 36

$$\frac{7}{9} = \frac{7 \times 4}{9 \times 4} = \frac{28}{36} \text{ and } \frac{5}{12} = \frac{5 \times 3}{12 \times 3} = \frac{15}{36} \text{ compare } \frac{28}{36} \text{ and } \frac{15}{36}$$

$28 > 15$

$$\therefore \frac{28}{36} > \frac{15}{36} \text{ or } \frac{7}{9} > \frac{5}{12}$$

Illustration 5.9

Which of the fractions is greater $\frac{3}{8}$ or $\frac{5}{16}$?

Sol. To convert $\frac{3}{8}$ into a fraction with denominator 16, it is converted into an equivalent fraction

$$\text{with denominator 16, } \frac{3}{8} = \frac{3 \times 2}{8 \times 2} = \frac{6}{16}$$

So, $\frac{3}{8}$ and $\frac{5}{16}$ will become $\frac{6}{16}$ and $\frac{5}{16}$ respectively. $\frac{6}{16}$ is greater. hence, $\frac{3}{8}$ is greater than $\frac{5}{16}$.

Illustration 5.10

Arrange in ascending order $\frac{5}{8}, \frac{5}{6}, \frac{7}{4}, \frac{3}{5}$

Sol. LCM of 8, 6, 4, 5

$$\text{LCM} = 2 \times 2 \times 2 \times 3 \times 5 = 120$$

$$\frac{5}{8} = \frac{5 \times 15}{8 \times 15} = \frac{75}{120} \quad (120 \div 8 = 15)$$

$$\frac{5}{6} = \frac{5 \times 20}{6 \times 20} = \frac{100}{120} \quad (120 \div 6 = 20)$$

$$\frac{7}{4} = \frac{7 \times 30}{4 \times 30} = \frac{210}{120} \quad (120 \div 4 = 30)$$

$$\frac{3}{5} = \frac{3 \times 24}{5 \times 24} = \frac{72}{120} \quad (120 \div 5 = 24)$$

Since $72 < 75 < 100 < 210$

$$\frac{72}{120} < \frac{75}{120} < \frac{100}{120} < \frac{210}{120}$$

$$\therefore \frac{3}{5} < \frac{5}{8} < \frac{5}{6} < \frac{7}{4}$$

Ask yourself



1. Represent $\frac{2}{5}$ on number line.
2. Represent $\frac{25}{11}$ on number line.
3. Compare the fractions $\frac{3}{4}$ and $\frac{5}{12}$.
4. Rearrange the given fractions in ascending order : $\frac{3}{5}, \frac{7}{15}, \frac{9}{20}, \frac{3}{10}$
5. Replace * by >, <, = to make the statement true.

(a) $\frac{3}{10} * \frac{4}{11}$	(b) $\frac{3}{13} * \frac{4}{39}$	(c) $\frac{10}{11} * \frac{11}{19}$	(d) $\frac{3}{8} * \frac{15}{40}$
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Answers

3. $\frac{3}{4} > \frac{5}{12}$
4. $\frac{3}{10} < \frac{9}{20} < \frac{7}{15} < \frac{3}{5}$
5. (a) $\frac{3}{10} < \frac{4}{11}$ (b) $\frac{3}{13} > \frac{4}{39}$ (c) $\frac{10}{11} > \frac{11}{19}$ (d) $\frac{3}{8} = \frac{15}{40}$

5.3 OPERATIONS OF FRACTION

(a) Addition of Fractions with like denominators:

To add two or more fractions having the same denominators, we add the numerators of the given fractions. The number thus obtained becomes the numerator of the required fraction and the denominator of this fraction is the common denominator of the given fractions.

Illustration 5.11

Add together : $\frac{4}{18}$ and $\frac{7}{18}$.

Sol. $\frac{4}{18} + \frac{7}{18} = \frac{4+7}{18} = \frac{11}{18}$.

(b) Addition of Fractions with unlike denominators :

First change all the fractions to their equivalent fractions with common denominator which is the L.C. M. of the denominators of the given fractions and then add them as explained earlier.

Illustration 5.12

Add : $\frac{2}{7}$ and $\frac{3}{14}$ and express the sum in its lowest terms.

Sol. We find the prime factors of 7 and 14.

$$7 = 7 \Rightarrow 14 = 7 \times 2$$

L.C.M. of 7 and 14 = $7 \times 2 = 14$

Now $\frac{2}{7} = \frac{2 \times 2}{7 \times 2} = \frac{4}{14}$

$$\therefore \frac{2}{7} + \frac{3}{14} = \frac{4}{14} + \frac{3}{14} = \frac{4+3}{14} = \frac{7}{14}$$

$$\frac{7}{14} = \frac{7 \div 7}{14 \div 7} = \frac{1}{2}$$

(c) Addition of Mixed Numbers

To add two or more mixed numbers, we change them to improper fractions and then add.

Illustration 5.13

Add : $1\frac{1}{8}$ and $3\frac{3}{8}$.

Sol. $1\frac{1}{8} + 3\frac{3}{8} = \frac{9}{8} + \frac{27}{8} = \frac{9+27}{8} = \frac{36}{8} = 4\frac{4}{8} = 4\frac{1}{2}$.

(d) Subtraction of fractions with like denominators

To subtract a fraction from another fraction of like denominator, we subtract the smaller numerator from the greater numerator. The number thus obtained is the numerator of the required fraction and the denominator of this fraction is the common denominator of the given fractions.

Illustration 5.14

Solve : $\frac{6}{11} - \frac{2}{11}$

Sol. $\frac{6}{11} - \frac{2}{11} = \frac{6-2}{11} = \frac{4}{11}$.

(e) Subtraction of fractions with unlike denominators

To subtract a fraction from another fraction of unlike denominators, we change both the fractions to equivalent fractions of common denominator and then subtract as explained earlier for fractions of like denominators.

Illustration 5.15

Solve : $\frac{17}{18} - \frac{5}{12}$.

Sol. L.C.M. of 18 and 12 = $2 \times 2 \times 3 \times 3 = 36$

Now $\frac{17}{18} = \frac{17 \times 2}{18 \times 2} = \frac{34}{36} \Rightarrow \frac{5}{12} = \frac{5 \times 3}{12 \times 3} = \frac{15}{36}$

$\Rightarrow \frac{17}{18} - \frac{5}{12} = \frac{34}{36} - \frac{15}{36} = \frac{34 - 15}{36} = \frac{19}{36}$.

(f) Subtraction of Mixed Numbers

To subtract mixed numbers, we change them to improper fractions and then subtract.

Illustration 5.16

Solve : $6\frac{1}{3} - 3\frac{2}{9}$.

Sol. L.C.M. of 3 and 9 = 9.

$6\frac{1}{3} - 3\frac{2}{9} = \frac{19}{3} - \frac{29}{9} = \frac{19 \times 3}{3 \times 3} - \frac{29}{9} = \frac{57}{9} - \frac{29}{9} = \frac{57 - 29}{9} = \frac{28}{9} = 3\frac{1}{9}$.

Ask yourself



1. Add the following and reduce to its lowest form :

(a) $\frac{1}{5} + \frac{3}{5}$

(b) $\frac{1}{2} + \frac{3}{4} + 1\frac{1}{3}$

(c) $5 + 1\frac{1}{4}$

(d) $\frac{4}{9} + \frac{2}{15} + \frac{3}{5}$

2. Find the difference and reduce to its lowest form:

(a) $6 - \frac{3}{4}$

(b) $2\frac{3}{8} - 1\frac{3}{16}$

(c) $\frac{8}{15} - \frac{3}{18}$

3. Subtract the sum of $\frac{5}{7}$ and $\frac{2}{3}$ from $2\frac{1}{2}$

4. Sarita bought $1\frac{2}{5}$ metre of ribbon and Lalita bought $\frac{3}{4}$ metre of ribbon. What is the total length of the ribbon they bought ?

5. Nandini's house is $2\frac{9}{10}$ km from her school. She walked some distance and then took a bus for $1\frac{1}{4}$ km to reach the school. How far did she walk?

Answers

1. (a) $\frac{4}{5}$

(b) $\frac{31}{12}$

(c) $\frac{25}{4}$

(d) $\frac{53}{45}$

2. (a) $\frac{21}{4}$

(b) $\frac{19}{16}$

(c) $\frac{11}{30}$

3. $\frac{47}{20}$ m

4. $\frac{43}{20}$ km

5. $\frac{33}{20}$ km



Add to Your Knowledge

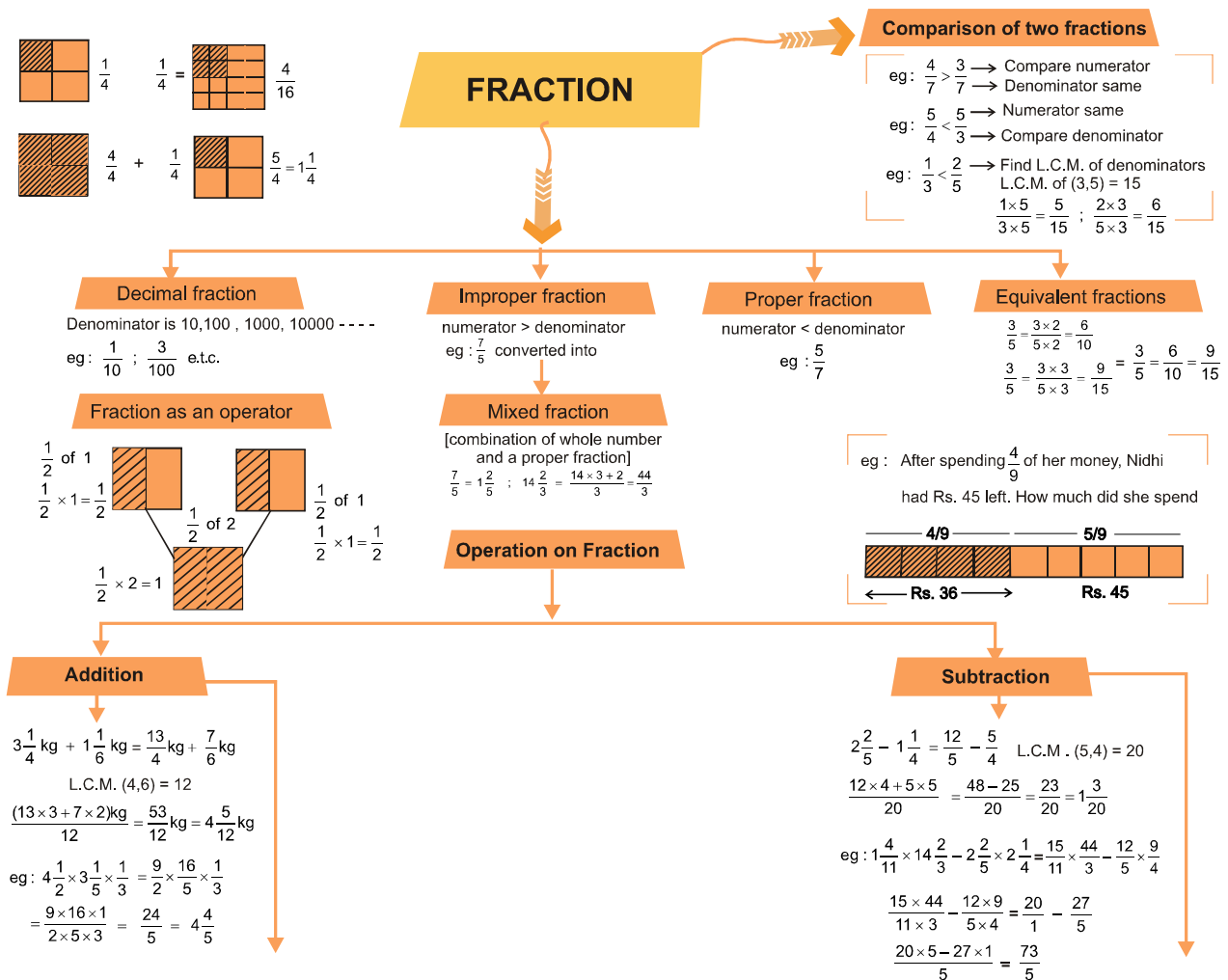
1. Rational Numbers : Numbers that can be expressed in the form $\frac{p}{q}$, where q is a non-zero integer and p is any integer are called rational numbers.

(a) Every fraction is a rational number but a rational number need not be a fraction .

(b) A rational number $\frac{p}{q}$ is said to be in the standard form if q is a positive integer and the integers $\frac{p}{q}$ have no common divisor other than 1.

(c) **Equivalent Rational Numbers** : To convert a rational number to an equivalent rational number, either multiply or divide both its numerator and denominator by a non-zero integer.

Concept Map



Summary

1. A fraction is a part of the whole or a collection of objects.
2. Numerator of a fraction shows the number of parts considered and denominator shows the total number of parts.
3. A fraction $\frac{a}{b}$ in which $a < b$ i.e. numerator is less than the denominator e.g. $\frac{3}{7}$ is called a proper fraction.
4. A fraction $\frac{a}{b}$ in which $a = b$ or $a > b$ i.e. numerator is greater than or equal to the denominator e.g. $\frac{9}{7}$ is called a improper fraction.
5. A fraction like $a \frac{b}{c}$, i.e. , a combination of a natural number a and a proper fraction $\frac{b}{c}$ is called a mixed fraction. e.g. $4 \frac{7}{8} = 4 + \frac{7}{8}$
6. Fractions having the same denominator, like $\frac{2}{9}, \frac{4}{9}, \frac{15}{9}$, etc are called like fractions, otherwise they are unlike fractions.
7. Fractions having equal value , like, $\frac{1}{2}, \frac{2}{4}, \frac{3}{6}$ etc. are called equivalent fractions. The fractions $\frac{a}{b}$ and $\frac{c}{d}$ are equivalent fractions if $ad = bc$.
8. (i) A fraction $\frac{a}{b}$ is said to be in simplest form or in lowest terms if a and b do not have a common factor (except 1) i.e., their HCF is 1
 (ii) To reduce a given fraction $\frac{a}{b}$ to lowest terms, start dividing the numerator a and denominator b by their common factors , i.e., divide a and b by their HCF.
9. Comparing fractions $\frac{a}{b}$ and $\frac{c}{d}$:
 (i) If $ad > bc$, then $\frac{a}{b} > \frac{c}{d}$ (ii) If $ad < bc$, then $\frac{a}{b} < \frac{c}{d}$ (iii) If $ad = bc$, then $\frac{a}{b} = \frac{c}{d}$.
10. Sum or difference of two like fractions = $\frac{\text{sum or difference of their numerator}}{\text{Common denominator}}$
11. To add or subtract unlike fractions change it into like fractions and then add or subtract.

SECTION -A (FIXED RESPONSE TYPE)
MULTIPLE CHOICE QUESTIONS

1. Four pizzas are to be equally shared among 5 children. What is each child's share ?
 (A) $\frac{5}{4}$ (B) $\frac{1}{4}$ (C) $\frac{1}{5}$ (D) $\frac{4}{5}$
2. $\frac{24}{60}$ reduced to its simplest form is :
 (A) $\frac{12}{30}$ (B) $\frac{6}{15}$ (C) $\frac{3}{5}$ (D) $\frac{2}{5}$
3. What fraction of an hour is 20 minute ?
 (A) $\frac{1}{3}$ (B) $\frac{1}{2}$ (C) $\frac{1}{4}$ (D) $\frac{1}{5}$
4. Which of the following is the smallest fraction ?
 (A) $\frac{3}{12}$ (B) $\frac{5}{9}$ (C) $\frac{1}{3}$ (D) $\frac{4}{15}$
5. The denominator of fraction $\frac{9}{17}$ is ?
 (A) 9 (B) 17 (C) 3 (D) None of these
6. A fraction whose numerator is less than its denominator is called :
 (A) a proper fraction (B) an improper fraction
 (C) a mixed fraction (D) none of these
7. Fractions having equal denominators are called :
 (A) like fractions (B) unit fractions (C) proper fractions (D) improper fractions
8. An improper fraction is always :
 (A) > 1 (B) < 1 (C) $= 1$ (D) none of these
9. An improper fraction is always represent as :
 (A) proper fractions (B) unit fractions (C) like fractions (D) mixed fraction
10. The length of Femur, the longest bone in the human body is $\frac{101}{2}$ cm. Write this as a mixed number.
 (A) $5\frac{1}{2}$ (B) $2\frac{1}{50}$ (C) $50\frac{1}{2}$ (D) $100\frac{1}{2}$
11. Which operations are used to change a mixed number to an improper fraction ?
 (A) division and subtraction (B) multiplication and addition
 (C) multiplication and subtraction (D) division and addition

12. $\frac{18}{5}$ can be expressed as :
- (A) $3\frac{3}{5}$ (B) $5\frac{3}{2}$ (C) $3\frac{5}{3}$ (D) $2\frac{3}{5}$
13. $\frac{11}{7}$ can be expressed in the form
- (A) $7\frac{1}{4}$ (B) $4\frac{1}{7}$ (C) $1\frac{4}{7}$ (D) $11\frac{1}{7}$
14. The mixed fraction $5\frac{4}{7}$, can be expressed as
- (A) $\frac{33}{7}$ (B) $\frac{39}{7}$ (C) $\frac{33}{4}$ (D) $\frac{39}{4}$
15. Which denominator makes the fraction $\frac{2}{9}$ and $\frac{6}{\square}$ equivalent ?
- (A) 27 (B) 3 (C) 54 (D) 81
16. If $\frac{5}{8} = \frac{20}{p}$ then value of p is
- (A) 23 (B) 2 (C) 32 (D) 16
17. The equivalent fraction of $\frac{5}{7}$ with numerator 25 is :
- (A) $\frac{25}{35}$ (B) $\frac{25}{7}$ (C) $\frac{5}{35}$ (D) none of these
18. Which pair of fractions are equivalent ?
- (A) $\frac{9}{15}, \frac{3}{10}$ (B) $\frac{3}{11}, \frac{15}{33}$ (C) $\frac{14}{21}, \frac{12}{18}$ (D) $\frac{2}{5}, \frac{6}{20}$
19. What fraction of numbers from 1 to 15 are prime numbers.
- (A) $\frac{8}{15}$ (B) $\frac{7}{15}$ (C) $\frac{6}{15}$ (D) $\frac{9}{15}$
20. An equivalent fraction of $\frac{18}{24}$ with numerator 15 is :
- (A) $\frac{3}{8}$ (B) $\frac{15}{8}$ (C) $\frac{15}{20}$ (D) none of these
21. Which of the following fraction is the greatest ?
- (A) $\frac{5}{7}$ (B) $\frac{5}{6}$ (C) $\frac{5}{9}$ (D) $\frac{5}{8}$
22. Which of the following fraction is the smallest ?
- (A) $\frac{7}{8}$ (B) $\frac{9}{8}$ (C) $\frac{3}{8}$ (D) $\frac{5}{8}$

23. Reena has $\frac{6}{8}$ of a chocolate bar and Sarika has $\frac{3}{4}$ of an identical bar. Which of the following statements is true ?
 (A) Reena has more chocolate than Sarika.
 (B) Sarika has more chocolate than Reena.
 (C) Sarika has twice the amount of chocolate as Reena.
 (D) Reena has smaller pieces of chocolate, but the same amount as Sarika.
24. Mrs. Verma split a bag of chocolates amongst four children. Payal got $\frac{7}{15}$, Shubh got $\frac{7}{8}$, Raj got $\frac{7}{20}$ and Lara got $\frac{7}{10}$. Arrange the names of the children in the order from least to greatest number of chocolates.
 (A) Lara, Payal, Shubh, Raj
 (B) Raj, Payal, Lara, Shubh
 (C) Shubh, Raj, Lara, Payal
 (D) Payal, Lara, Shubh, Raj
25. Four children order their own small pizza of the same size. Maria eats $\frac{3}{4}$ of her pizza, Rahul eats $\frac{7}{12}$ of his pizza, Ronnie eats $\frac{3}{5}$ of his pizza and Vinni eats $\frac{5}{6}$ of her pizza. Who eats the most amount of pizza ?
 (A) Maria
 (B) Rahul
 (C) Ronnie
 (D) Vinni
26. $\frac{1}{5} + \frac{2}{5} + \frac{3}{5} + \frac{4}{5} = ?$
 (A) 2
 (B) 1
 (C) 5
 (D) none of these
27. If one - third of a tank holds 80 litres of water, then the quantity of water that half of the tank holds is:
 (A) $\frac{80}{3}$ litres
 (B) 100 litres
 (C) 120 litres
 (D) 240 litres
28. On subtracting $\frac{5}{9}$ from $\frac{19}{9}$, the result is
 (A) $\frac{24}{9}$
 (B) $\frac{14}{9}$
 (C) $\frac{14}{18}$
 (D) $\frac{14}{0}$
29. Sum of $\frac{4}{17}$ and $\frac{15}{17}$ is
 (A) $\frac{19}{17}$
 (B) $\frac{11}{17}$
 (C) $\frac{19}{34}$
 (D) $\frac{2}{17}$
30. Sanya is making a pudding for which she requires $\frac{3}{4}$ cup of crushed nuts. If she has $\frac{2}{5}$ cup of crushed nuts, how much more does she need ?
 (A) $\frac{1}{4}$
 (B) $\frac{7}{20}$
 (C) $\frac{1}{5}$
 (D) $\frac{9}{20}$
31. Janet went on a two week holiday. She spent $\frac{2}{3}$ of her holiday money in the first week, $\frac{1}{4}$ in the second week. What fraction of her holiday money did she bring back home ?
 (A) $\frac{5}{12}$
 (B) $\frac{1}{3}$
 (C) $\frac{1}{2}$
 (D) $\frac{1}{12}$

FILL IN THE BLANKS

- $\frac{72}{90}$ reduced to simplest form is _____
- A fraction, whose numerator is less than its denominator, is called _____
- A number representing a part of a _____ is called a fraction.
- A fraction with denominator greater than the numerator is called a _____ fraction.
- Fraction with the same denominator are called _____ fractions.
- The fraction $\frac{17}{34}$ in simplest form is _____.
- _____ and _____ operations are used to change a mixed number to an improper fraction
- $\frac{45}{60}$ is equivalent to $\frac{3}{x}$, then $x =$ _____
- A fraction $\frac{a}{b}$ is greater than $\frac{c}{d}$ if the cross products _____
- For comparison of fraction first we convert fractions into _____
- $6\frac{1}{6} - ? = \frac{29}{30}$
- $\frac{17}{9} + \frac{41}{9} =$ _____.
- The fraction to be added to $6\frac{7}{15}$ to get $8\frac{1}{5}$ is equal to _____
- A piece of wire $\frac{7}{8}$ m long broke into 2 pieces .One piece was $\frac{1}{4}$ m long. Then the length of other piece is _____.
- Sum of one fourth and (one third of 6) is _____

TRUE / FALSE

- $\frac{3}{5}$ lies between 3 and 5
- $\frac{1}{2}$, $\frac{1}{3}$ and $\frac{1}{4}$ are like fractions
- Fractions with same numerator are called like fractions.
- Fraction $\frac{18}{39}$ is in its lowest form .

5. $\frac{13}{39}, \frac{5}{15}$ are a pair of equivalent fractions.

6. Among $\frac{1}{2}, \frac{1}{3}, \frac{3}{4}, \frac{4}{3}$ the largest fraction is $\frac{4}{3}$

7. $3\frac{1}{3} > \frac{33}{10}$

8. $\frac{3}{12}$ is greater than $\frac{3}{17}$

9. $\frac{12}{5}$ is greater than $\frac{13}{5}$

10. $8 - 1\frac{5}{6} = 7\frac{1}{6}$

11. $\frac{8}{18} - \frac{8}{15} = \frac{8}{3}$

12. $\frac{5}{6} - \frac{1}{2} > \frac{3}{4} - \frac{2}{3}$

MATCH THE COLUMN

1. **Column-I**

(A) 2/12

(B) 5/7

(C) 1/5

(D) 4/30

(E) 6/60

Column II

(p) 60/84

(q) 1/10

(r) 52/390

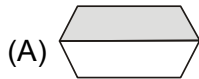
(s) 12/72

(t) 20/100

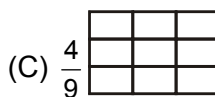
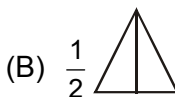
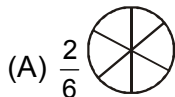
SECTION -B (FREE RESPONSE TYPE)

VERY SHORT ANSWER TYPE

1. Write the fractions representing the shaded portions.



2. Colour the part according to the given fraction.



3. Find : $\frac{1}{6}$ of 30 hours

4. Compare the fractions $\frac{6}{11}$ and $\frac{3}{19}$

5. Compare the fractions $\frac{3}{4}$ and $\frac{5}{12}$

6. Find the sum : $\frac{1}{4} + \frac{0}{4}$

7. Fill the empty box. $\frac{7}{12} - \frac{1}{12} - \square = \frac{1}{12}$

SHORT ANSWER TYPE

8. Write each of the following fractions in numerals.
 (i) 3 out of 5 (ii) one - quarter (iii) eight-seventeenth
9. What fraction of an hour is 35 minutes ?
10. What fraction of a day is 11 hour ?
11. Re-arrange the given fractions in ascending order :
 $\frac{7}{15}$, $\frac{11}{12}$ and $\frac{13}{35}$
12. Re-arrange the given fractions in descending order :
 $\frac{3}{7}$, $\frac{4}{21}$, $\frac{11}{42}$, $\frac{13}{28}$
13. Add the following
 (i) $\frac{5}{6} + \frac{7}{12}$ (ii) $\frac{3}{10} + \frac{4}{5} + \frac{1}{2}$ (iii) $1\frac{5}{8} + \frac{1}{8}$ (iv) $1\frac{4}{5} + 2\frac{7}{10}$
14. Subtract the following.
 (i) $\frac{1}{2} - \frac{3}{8}$ (ii) $\frac{9}{10} - \frac{3}{5}$ (iii) $2\frac{7}{8} - 1\frac{1}{4}$ (iv) $4\frac{1}{2} - \frac{3}{10}$
15. Solve the following :
 (i) $\frac{8}{17} + \frac{5}{17}$ (ii) $1 - \frac{3}{4}$
16. Find :
 (i) $\frac{3}{11}$ of Rs 44 (ii) $\frac{5}{7}$ of 54 weeks (iii) $\frac{11}{80}$ of 4000 ml
17. Kamal has 55 Toffees. He gives $\frac{5}{11}$ of them to Kavi. How many does Kavi get ? how many are left with Kamal ?

LONG ANSWER TYPE

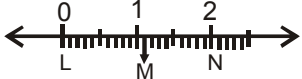
18. Show the following sets of fractions on the number line.
 $\frac{2}{5}$, $\frac{0}{5}$, $\frac{4}{5}$, $\frac{6}{5}$, $\frac{13}{5}$, $4\frac{2}{5}$
19. Write natural numbers from 2 to 15. What fraction of them are even ?
20. Deepak and Amir bought a cake. Deepak ate $\frac{2}{5}$ of the cake. Amir ate $\frac{3}{10}$ of it.
 (a) Who ate more ? (b) How much more
21. A wheel barrow can hold $26\frac{1}{4}$ kg. Four rocks that weigh $6\frac{1}{8}$ kg, $8\frac{1}{2}$ kg, $4\frac{3}{4}$ kg and $7\frac{1}{2}$ kg are to be loaded into the wheel barrow . Can the wheel barrow hold all the four rocks?
22. Simplify : $5\frac{1}{6} + 2\frac{1}{3} - 5\frac{11}{12}$

23. The length of a stick is 45 m. What is the length of $\frac{2}{9}$ of the stick.
24. Abhijit spent $\frac{1}{3}$ of an hour painting his toy aeroplane and $\frac{1}{6}$ of an hour polishing his shoes. How much time did he spend together ?
25. Rekha mixes $\frac{1}{2}$ L of water with $\frac{1}{8}$ L of orange squash. How much mixture does she get ?
26. In a vegetable garden $\frac{1}{6}$ of the area is covered with lettuce and $\frac{5}{12}$ with tomato plants. What fraction of the area is planted with these ?
27. You read 37 pages of a chapter in your book and have 13 pages left. What fraction of the chapter have you read ?

EXERCISE 02

SECTION -A (COMPETITIVE EXAMINATION QUESTION)

MULTIPLE CHOICE QUESTIONS

1. Look at the alphabets in the word "KRISHNA". What fraction of the alphabets are made of 3 straight lines?
 (A) $\frac{4}{7}$ (B) $\frac{3}{7}$ (C) $\frac{5}{7}$ (D) $\frac{6}{7}$
2. Two consecutive integers between which the fraction $\frac{5}{7}$ lies are :
 (A) 5 and 6 (B) 0 and 1 (C) 5 and 7 (D) 6 and 7
3. In the given number line, point M represents which of the following fractional numbers ?

 (A) $\frac{2}{8}$ (B) $\frac{6}{5}$ (C) $\frac{2}{3}$ (D) $\frac{11}{10}$
4. The difference between $1\frac{5}{11}$ and its reciprocal is
 (A) $1\frac{41}{135}$ (B) $1\frac{41}{55}$ (C) $\frac{135}{176}$ (D) $\frac{141}{176}$
5. About $\frac{3}{5}$ of the world's population lives in Asia and the people of Europe make up about $\frac{3}{25}$ of the world's population. What fraction of the world's population live in either Asia or Europe ?
 (A) $\frac{9}{25}$ (B) $\frac{6}{25}$ (C) $\frac{18}{25}$ (D) $\frac{16}{25}$

6. To divide $\frac{1}{3}$ by $\frac{2}{3}$, we multiply $\frac{1}{3}$ by
- (A) $\frac{2}{3}$ (B) $\frac{3}{2}$ (C) 1 (D) 0
7. Madhavi eats one full bar of chocolate. Then she divides another one into 5 equal parts and eats 3 of those parts. The total number of chocolates that she has eaten is
- (A) $\frac{4}{5}$ (B) $\frac{3}{5}$ (C) $\frac{8}{5}$ (D) $\frac{8}{10}$
8. Which of the following statement is true ?
- (A) Fractions with same numerator are called like fractions.
 (B) Fractions with same denominator are called unlike fractions.
 (C) Difference of two like fractions = $\frac{\text{differece of numerators}}{\text{common denominator}}$.
 (D) A fraction with numerator greater than or equal to the denominator is called proper fraction.
9. In the word **GOPAL**, what fraction of alphabets are made of three lines ?
- (A) $\frac{2}{5}$ (B) $\frac{1}{5}$ (C) $\frac{3}{5}$ (D) $\frac{4}{5}$
10. The average of the middle fractions if $\frac{4}{7}, \frac{1}{3}, \frac{2}{3}, \frac{5}{9}$ are arranged in ascending order is
- (A) $\frac{4}{9}$ (B) $\frac{71}{63}$ (C) $\frac{4}{18}$ (D) $\frac{71}{126}$
11. How many $\frac{1}{8}$'s are there in is $37\frac{1}{2}$?
- (A) 275 (B) 300 (C) 325 (D) none of these
12. The product of the 9 fractions $\left(1-\frac{1}{2}\right)\left(1-\frac{1}{3}\right)\left(1-\frac{1}{4}\right) \dots \left(1-\frac{1}{10}\right) = \dots$
- (A) $\frac{10}{11}$ (B) $\frac{1}{9}$ (C) $\frac{1}{10}$ (D) $\frac{1}{2}$
13. The value of $\left(1-\frac{1}{3}\right)\left(1-\frac{1}{4}\right)\left(1-\frac{1}{5}\right)\left(1-\frac{1}{6}\right) \dots \left(1-\frac{1}{n}\right)$ is
- (A) $\frac{1}{n}$ (B) $\frac{2}{n}$ (C) $\frac{2(n-1)}{4}$ (D) $\frac{2}{n(n+1)}$

SECTION -B (TECHIE STUFF)

14. The value of $\frac{1}{1+\frac{1}{2+\frac{1}{3}}}$ is
- (A) $\frac{3}{7}$ (B) $\frac{10}{7}$ (C) $\frac{7}{10}$ (D) $\frac{5}{11}$

15. Standard form of $\frac{-60}{72}$
 (A) $\frac{6}{5}$ (B) $\frac{-5}{6}$ (C) $\frac{-1}{6}$ (D) None of these
16. If $\frac{-9}{5} = \frac{a}{20} = \frac{27}{b} = \frac{-45}{c}$, then the values of a, b and c is
 (A) $a = -36, b = -15, c = 25$ (B) $a = -36, b = -15, c = -3$
 (C) $a = -30, b = -15, c = -36$ (D) $a = -15, b = -25, c = 25$
17. Out of the rational numbers $\frac{7}{-13}, \frac{-5}{13}, \frac{-11}{13}$, which is the smallest?
 (A) $\frac{7}{-13}$ (B) $\frac{-5}{13}$ (C) $\frac{-11}{13}$ (D) All are equal
18. Out of the rational numbers $\frac{5}{-11}, \frac{5}{-12}, \frac{5}{-17}$, which is the greatest?
 (A) $\frac{5}{-11}$ (B) $\frac{5}{-12}$ (C) $\frac{5}{-17}$ (D) All are equal

EXERCISE 03

(PREVIOUS YEAR EXAMINATION QUESTIONS)

1. A sixth- grade completed a survey about favourite drinks. Of the students in the class $\frac{2}{6}$, chose Coke, and $\frac{3}{8}$ chose Sprite. What fraction of the class chose either Coke or Sprite as their favourite drink? (NSTSE 2009)
 (A) $\frac{1}{24}$ (B) $\frac{6}{48}$ (C) $\frac{5}{14}$ (D) $\frac{17}{24}$
2. Bobby is sorting some nails by their lengths. The lengths of the nails are $2\frac{1}{2}$ cm, $2\frac{3}{4}$ cm, $\frac{3}{4}$ cm, $3\frac{1}{2}$ cm and $2\frac{1}{4}$. Which of the following statements is correct? (NSTSE 2009)
 (A) $2\frac{1}{2} < 2\frac{1}{4} < \frac{3}{4} < 3\frac{1}{2} < 2\frac{3}{4}$ (B) $\frac{3}{4} < 2\frac{1}{4} < 2\frac{1}{2} < 2\frac{3}{4} < 3\frac{1}{2}$
 (C) $\frac{3}{4} < 2\frac{1}{2} < 2\frac{1}{4} < 3\frac{1}{2} < 2\frac{3}{4}$ (D) $3\frac{1}{2} < 2\frac{3}{4} < 2\frac{1}{2} < 2\frac{1}{4} < \frac{3}{4}$
3. If 8 boys share 14 cakes, how much of the cakes does each boy get? (NSTSE 2010)
 (A) $\frac{3}{7}$ (B) $\frac{4}{7}$ (C) $1\frac{3}{4}$ (D) $2\frac{1}{3}$

4. Raju spent $\frac{7}{12}$ of his salary. If the remaining of the salary is Rs 250 less than what he spent, what is his salary? **(NSTSE 2010)**
 (A) Rs 600 (B) Rs 1500 (C) Rs 850 (D) Rs 61250

5. What is the sum of the shaded parts if shaded parts are expressed in fractions? **(IMO 2010)**



- (A) $\frac{11}{9}$ (B) $\frac{11}{7}$ (C) $\frac{11}{18}$ (D) $\frac{7}{18}$
6. Sasha is using a wooden strip $\frac{7}{8}$ m long to make a picture frame. If she cuts off a piece that is $\frac{3}{4}$ m long, which fraction best represents the portion that is left of the original strip? **(IMO 2010)**
 (A) $\frac{13}{8}$ m (B) 1 m (C) $\frac{1}{4}$ m (D) $\frac{1}{8}$ m

7. A fraction is equivalent to $\frac{5}{8}$. Its denominator and numerator adds up to 91. What is the difference between numerator and denominator of this fraction? **(NSTSE 2011)**
 (A) 21 (B) 33 (C) 13 (D) 19

8. What is the mixed number represented by 'X' below shown number line? **(NSTSE 2011)**



- (A) $2\frac{4}{5}$ (B) $2\frac{2}{5}$ (C) $2\frac{1}{2}$ (D) $2\frac{3}{4}$
9. An oil tank contains $30\frac{2}{5}$ litres of oil. It is then filled with $37\frac{2}{3}$ litres of oil. Later, $56\frac{1}{9}$ litres of oil is pumped out from the tank. What is the volume of oil left in the tank in litres? **(IMO 2011)**
 (A) $11\frac{43}{45}$ (B) $12\frac{43}{45}$ (C) $37\frac{8}{3}$ (D) $18\frac{4}{45}$

10. Which of the following has fraction in ascending order. **(IMO 2011)**

- (A) $\frac{2}{3}, \frac{3}{5}, \frac{7}{9}, \frac{9}{11}, \frac{8}{9}$ (B) $\frac{3}{5}, \frac{2}{3}, \frac{7}{9}, \frac{9}{11}, \frac{8}{9}$ (C) $\frac{8}{9}, \frac{9}{11}, \frac{7}{9}, \frac{2}{3}, \frac{3}{5}$ (D) $\frac{8}{9}, \frac{9}{11}, \frac{7}{9}, \frac{3}{5}, \frac{2}{3}$

11. If one-third of a tank holds 80 litres of water, then the quantity of water that half of the tank holds is **(IMO 2011)**
 (A) $\frac{80}{3}$ litres (B) 100 litres (C) 120 litres (D) 240 litres

12. In a class of 50 students, 15 are girls. 5 girls and $\frac{2}{7}$ of the boys were chosen to play a match. The total number of students chosen to play a match is **(IMO 2011)**
 (A) 12 (B) 15 (C) 19 (D) 25
13. Avni completed $\frac{1}{5}$ of her holiday homework on Monday and $\frac{3}{4}$ of it on Tuesday. How much of her holiday homework did Avni complete in the two days? **(IMO 2011)**
 (A) 1 (B) $\frac{4}{9}$ (C) $\frac{3}{20}$ (D) $\frac{19}{20}$
14. Renu did $\frac{1}{2}$ of the work yesterday and one-third of the work today, how much work will she have to do tomorrow to complete the work? **(NSTSE 2012)**
 (A) $\frac{5}{6}$ (B) $\frac{6}{5}$ (C) $\frac{2}{3}$ (D) $\frac{1}{6}$
15. Which of the following fractions is nearest to $\frac{3}{5}$? **(NSTSE 2012)**
 (A) $\frac{499}{600}$ (B) $\frac{299}{500}$ (C) $\frac{599}{600}$ (D) $\frac{399}{500}$
16. Which of the following represents the fraction of Figure X that is shaded? **(IMO 2012)**

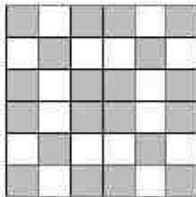


Figure X

- (A) $\frac{1}{2}$ (B) $\frac{2}{3}$ (C) $\frac{4}{5}$ (D) $\frac{5}{9}$
17. Evaluate $12\frac{1}{3} - 9\frac{3}{5} + 8.4 \div 0.02$ **(IMO 2012)**
 (A) 81.83 (B) 420.73 (C) 422.73 (D) 42.273
18. Which of the following fractions is smaller than $\frac{5}{9}$? **(IMO 2012)**
 (A) $\frac{1}{4}$ (B) $\frac{11}{13}$ (C) $\frac{5}{7}$ (D) $\frac{6}{7}$
19. Divya and Megha collected newspapers for recycling. Divya collected $5\frac{3}{7}$ grams of newspaper. Megha collected $2\frac{1}{4}$ grams of newspaper. What was the total amount of newspaper they collected? **(IMO 2012)**
 (A) 8 grams (B) $8\frac{1}{2}$ grams (C) $7\frac{19}{28}$ grams (D) $7\frac{18}{28}$ grams

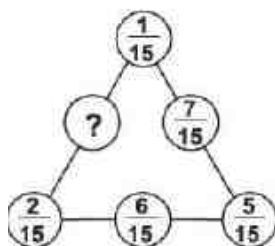
20. A tin of oil was $\frac{4}{5}$ full. When six bottles of oil were taken out and four bottles of oil were poured into it, it was $\frac{3}{4}$ full. How many bottles of oil can the tin contain? **(IMO 2012)**
 (A) 40 (B) 30 (C) 70 (D) 80

21. Which of the following decimals represents the shaded part in the given figure? **(IMO 2012)**



- (A) 0.1 (B) 0.5 (C) 0.2 (D) 0.7

22. What should be placed in place of ? so that the sum of fractions on each side of the triangle is same? **(IMO 2012)**



- (A) $\frac{7}{15}$ (B) $\frac{9}{15}$ (C) $\frac{6}{15}$ (D) $\frac{10}{15}$

23. Four families went on a picnic. Each family carried a cake for picnic. 3 of each cake was eaten. How much cake was eaten in all? **(IMO 2012)**

- (A) $\frac{3}{8}$ (B) 3 (C) $\frac{9}{12}$ (D) 1

24. Pranay spent $\frac{1}{8}$ th of his money on food. He spent 3 times as much as what he spent on food on a pair of shoes and $\frac{1}{3}$ rd of its on transport. What fraction of his money was left ? **(NSTSE 2013)**

- (A) $\frac{7}{8}$ (B) $\frac{13}{24}$ (C) $\frac{1}{2}$ (D) $\frac{1}{6}$

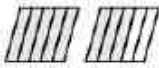



25. What is the missing number in the box ? **(NSTSE 2013)**

$$\boxed{1\frac{2}{5} + 1\frac{2}{5} + 1\frac{2}{5} + 1\frac{2}{5} = ? \times \frac{7}{5} + 1\frac{2}{5}}$$

- (A) 21 (B) 2 (C) 3 (D) 4

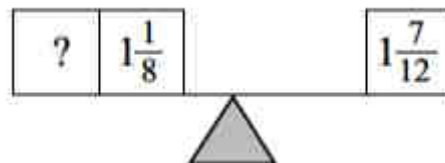
26. What must be added to the product of $2\frac{4}{7}$ and 3 to make $21\frac{5}{14}$ **(IMO 2013)**

- (A) $13\frac{9}{12}$ (B) $12\frac{9}{14}$ (C) $13\frac{9}{14}$ (D) $15\frac{11}{14}$

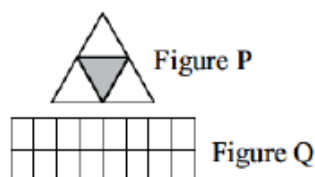
27. $\frac{2}{3}$ of the books in a box are English books, $\frac{1}{4}$ are Maths books and the rest are Science books. What fraction of the books are science books? **(IMO 2013)**
 (A) $\frac{2}{3} - \frac{1}{4}$ (B) $\frac{2}{3} \times \frac{1}{4}$ (C) $1 - \left(\frac{2}{3} + \frac{1}{4}\right)$ (D) $1 - \left(\frac{2}{3} - \frac{1}{4}\right)$
28. Mayank is $1\frac{2}{5}$ times as tall as Vansh. If Mayank is 38 cm taller than Vansh, what is Mayank's height? **(IMO 2013)**
 (A) 133 cm (B) 123 cm (C) 95 cm (D) 129 cm
29. Which of the following is true? **(IMO 2013)**
Statement I : A fraction is said to be in the simple (or lowest) form if its numerator and denominator have no common factor except 1.
Statement II : Simplest form of $\frac{686}{1715}$ is $\frac{3}{5}$.
 (A) Statement I and statement II both are true.
 (B) Statement I is false and statement II is true.
 (C) Statement I is true and statement II is false.
 (D) Statement I and statement II both are false.
30. Select the correct match of fractions of the unshaded part. **(IMO 2013)**
 (A)  $1\frac{1}{5}$ (B)  $1\frac{2}{3}$
 (C)  $\frac{4}{7}$ (D)  $\frac{4}{9}$
31. A shopkeeper bought 50 kg of sugar. He sold $\frac{1}{4}$ of the sugar. Find the weight of sugar that was left. **(IMO 2013)**
 (A) 37.5 kg (B) 37500 g (C) $50 \times \frac{3}{4}$ kg (D) All of these
32. Vineet measured the lengths of two bugs he found. The cricket was three-fourths of a unit long. The ant was one-eighth of a unit long. How much longer was the cricket than the ant? **(IMO 2013)**
 (A) $\frac{3}{8}$ (B) $\frac{5}{8}$ (C) $\frac{2}{7}$ (D) $\frac{11}{7}$
33. If $\frac{7}{9}$ of a number is 63, then $\frac{1}{3}$ of the number is **(IMO 2014)**
 (A) 21 (B) 27 (C) 49 (D) 42
34. Find the missing number $14\frac{3}{4} \times 4\frac{1}{2} - 3\frac{1}{4} \times 4\frac{1}{2} + 11\frac{1}{2} \times 5\frac{1}{2} = \underline{\quad} - 4$. **(IMO 2014)**
 (A) $32\frac{3}{8}$ (B) 111 (C) 115 (D) 119
35. A bottle is $\frac{3}{4}$ full of water. The water in the bottle can fill 5 glasses. If the water in the bottle is poured out to fill 3 glasses. Find the fraction of the water left in bottle. **(IMO 2014)**
 (A) $\frac{9}{10}$ (B) $\frac{3}{5}$ (C) $\frac{9}{20}$ (D) $\frac{3}{10}$

36. The weight of three boys are $11\frac{3}{4}$ kg, $14\frac{1}{5}$ kg and $16\frac{1}{2}$ kg. (IMO 2014)
- (A) $41\frac{9}{20}$ kg (B) $43\frac{9}{20}$ kg (C) $42\frac{9}{20}$ kg (D) $44\frac{9}{20}$ kg

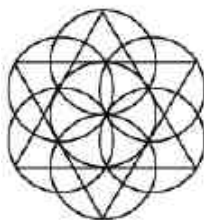
37. To balance the scale, write the missing fraction. (IMO 2014)



- (A) $\frac{11}{24}$ (B) $\frac{10}{24}$ (C) $\frac{5}{24}$ (D) $\frac{1}{24}$
38. How many parts should be shaded in the figure Q to make it the same fraction as the unshaded part in the figure? (IMO 2014)



- (A) 3 (B) 4 (C) 8 (D) 12
39. Find the fraction of curved lines to the total number of lines in the given figure (IMO 2014)



- (A) $6/13$ (B) $8/13$ (C) $7/13$ (D) $5/13$
40. A wheel barrow can hold _____ kg. If four rocks weighs $6\frac{1}{8}$ kg, $8\frac{1}{2}$ kg, $4\frac{3}{4}$ kg and $7\frac{1}{2}$ kg are to be loaded into the wheel barrow. (IMO 2014)
- (A) $26\frac{7}{8}$ (B) $24\frac{3}{8}$ (C) $26\frac{1}{8}$ (D) $24\frac{7}{8}$
41. A man spends $\frac{4}{15}$ of his monthly income on house rent, $\frac{1}{2}$ on food and $\frac{1}{5}$ on other items. He saves Rs. 800 in the end. What was his monthly income? (IMO 2014)
- (A) Rs.24,000 (B) Rs. 22,000 (C) Rs. 25,000 (D) Rs. 20,000
42. The capacity of a drum is 50 L and that of a bucket is $8\frac{3}{4}$ L . If 5 buckets of water is poured into the drum. What fraction of the drum remains empty? (IMO 2014)
- (A) $\frac{1}{4}$ (B) $\frac{1}{2}$ (C) $\frac{3}{4}$ (D) $\frac{1}{8}$

ANSWER KEY >>

EXERCISE >> 01

SECTION -A (FIXED RESPONSE TYPE)

MULTIPLE CHOICE QUESTIONS :

Ques.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Ans.	D	D	A	A	B	A	A	A	D	C	B	A	C	B	A	C	A	C	C	C
Ques.	21	22	23	24	25	26	27	28	29	30	31									
Ans.	B	C	D	B	D	A	C	B	A	B	D									

FILL IN THE BLANKS

- $\frac{4}{5}$
- proper fraction.
- Whole Number
- Proper fraction
- Like
- $\frac{1}{2}$
- multiplication and addition
- 4
- $ad > bc'$
- like terms
- $\frac{26}{5}$
- $\frac{58}{9}$
- $1\frac{11}{15}$
- $\frac{5}{8}$
- $\frac{9}{4}$.

TRUE / FALSE


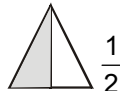
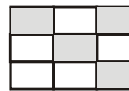
- False
- False
- False
- False
- True
- True
- True
- True
- False
- False
- False
- False

MATCH THE COLUMN

- (A)-s, (B)-p, (C)-t, (D)-r, (E)-q

SECTION -B (FREE RESPONSE TYPE)

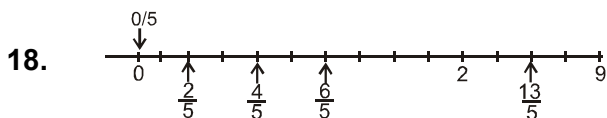
VERY SHORT ANSWER TYPE

- (a) $\frac{1}{2}$ (b) $\frac{1}{2}$ (c) $\frac{1}{5}$ (d) $\frac{3}{7}$
- (a)  $\frac{2}{6}$ (b)  $\frac{1}{2}$ (c)  $\frac{4}{9}$
- $\frac{1}{6}$ of 30 hrs = $\frac{1}{6} \times 30 = 5$ hrs
- $\frac{6}{11} > \frac{3}{19}$ 5. $\frac{3}{4} > \frac{5}{12}$
- $\frac{1}{4}$ 7. $\frac{5}{12} = x$

SHORT ANSWER TYPE

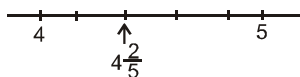
8. (i) $\frac{3}{5}$ (ii) $\frac{1}{4}$ (iii) $\frac{8}{17}$
9. $\frac{35}{60} = \frac{7}{12}$ 10. $\frac{11}{24}$ 11. $\frac{13}{35}, \frac{7}{15}, \frac{11}{12}$
12. $\frac{13}{28}, \frac{3}{7}, \frac{11}{42}, \frac{4}{21}$
13. (i) $\frac{17}{12}$ (ii) $\frac{8}{5}$ (iii) $\frac{7}{4}$ (iv) $\frac{9}{2}$
14. (i) $\frac{1}{8}$ (ii) $\frac{3}{10}$ (iii) $\frac{13}{8}$ (iv) $\frac{21}{5}$
15. (i) $\frac{13}{17}$ (ii) $\frac{1}{4}$
16. (i) Rs 12 (ii) $\frac{270}{7}$ weeks (iii) 550 ml
17. 25, 30

LONG ANSWER TYPE



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

$$\frac{13}{5} = 2 \frac{3}{5}$$



19. 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15 $\frac{7}{14} = \frac{1}{2}$
20. (a) Deepak ate more $\left(\frac{4}{10} > \frac{3}{10}\right)$
- (b) how much more $= \frac{4}{10} - \frac{3}{10} = \frac{1}{10}$
21. Weight of 4 rocks > weight of wheel barrow can hold.
∴ Wheel barrow cannot hold all the four rocks.
22. $\frac{19}{12}$ 23. 10 m 24. $\frac{1}{2}$ hr. 25. $\frac{5}{8}$ Litre
26. $\frac{7}{12}$ 27. $\frac{37}{50}$

EXERCISE >> 02

SECTION -A (COMPETITIVE EXAMINATION QUESTION)

MULTIPLE CHOICE QUESTIONS

Ques.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
Ans.	A	B	D	C	C	B	C	C	B	D	B	C	B	C	B	A	C	C

EXERCISE >> 03

(PREVIOUS YEAR EXAMINATION QUESTIONS)

Ques.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Ans.	D	B	C	B	A	D	A	A	A	B	C	B	D	D	B	D	C	A	C	A
Ques.	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Ans.	B	D	B	D	C	C	C	A	C	D	D	B	B	D	D	C	A	D	C	A
Ques.	41	42																		
Ans.	A	D																		