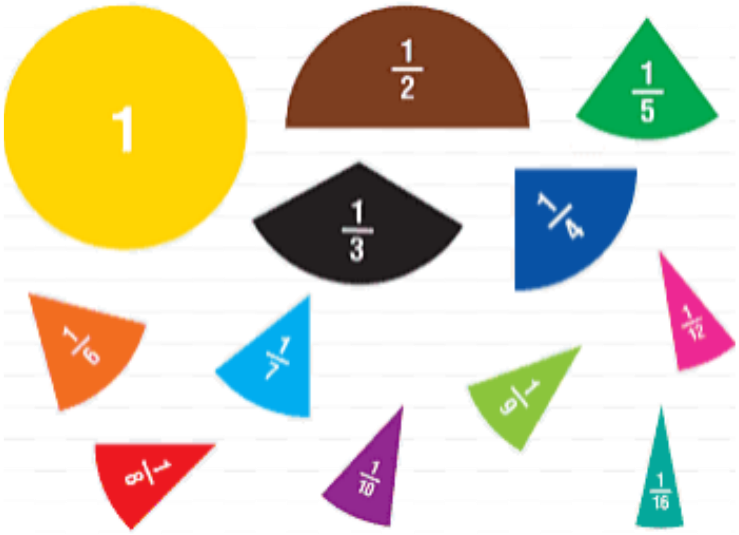
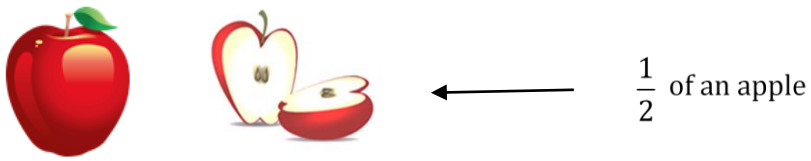
7 Fractions



Fractions

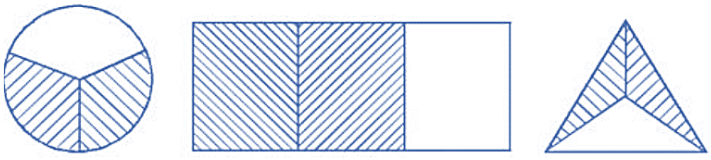
Fractions indicate equal parts of a whole thing.

$\frac{1}{2}$ 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 an apple.



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

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



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

3. It may represent a ratio, i.e., the number of objects in one group compared with the number of objects in another group. For example, the ratio of boys to girls shown in the picture is 2 : 3, which is represented by the fraction $\frac{2}{3}$.

4. It may represent 2 ÷ 3, the division of one number by another. In the fraction $\frac{2}{3}$, 2 is called the numerator of the fraction and 3 is called the denominator of the fraction.

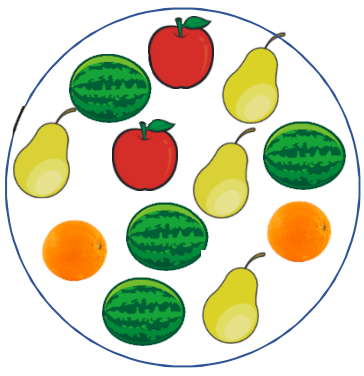
$$\frac{2 \leftarrow \text{Numerator}}{3 \leftarrow \text{Denominator}}$$

Do You Remember ?

✸ The word fraction comes from Latin word Fractio which meani 'to break'.

Fraction as a part of a whole

A fraction is a number representing a part of a whole. Fraction is written as $\frac{a}{b}$, where $b \neq 0$ and a and b are whole numbers. Here, a is the numerator and b is the denominator. We can also say that $\frac{a}{b} = a \div b$.

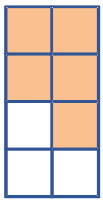


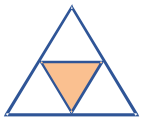
In figure, each fruit is represented by $\frac{1}{12}$ part of the whole. The numerator represents a number of equal parts and denominator which cannot be zero, indicates how many of those parts make up a unit or a whole.

Here, all 12 fruits make a fruits bowl. Here, apples are $\frac{2}{12}$, pears are $\frac{4}{12}$, watermelon are $\frac{4}{12}$ and oranges are $\frac{2}{12}$.

Building Concepts 1

What fraction is represented by the shaded parts in each of the diagrams below?

(i) 

(ii) 

(iii) 

Explanation

(i) $\frac{5}{8}$ (ii) $\frac{1}{4}$ (iii) $\frac{3}{6}=\frac{1}{2}$

SPOT LIGHT

Two fractions having different numerators and denominators can be compared by making the denominators same.

Numerical Ability 1

Write natural numbers from 2 to 12. What fraction of them are prime numbers?

Solution

Natural numbers from 2 to 12 are :

2,3,4,5,6,7,8,9,10,11,12 and their number = 11

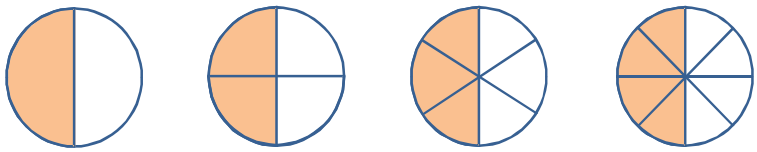
Out of these, the prime numbers are:

2,3,5,7,11 and their number = 5

$\therefore$ The required fraction = $\frac{5}{11}$

Equivalent fractions

Two or more fractions having the same value or representing the same part of a whole are called equivalent fractions. This can be shown by the figures given below where the fraction represented by the shaded portion is also given.



$\frac{1}{2}$ $\frac{2}{4}$ $\frac{3}{6}$ $\frac{4}{8}$

The shaded portion in all the figures above are equal.

$\therefore \frac{1}{2}=\frac{2}{4}=\frac{3}{6}=\frac{4}{8}=.....$

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

Since the value of a fraction does not change if the numerator and denominator of the given fraction are multiplied or divided by the same non-zero number, therefore, to get a fraction equivalent to a given fraction, we multiply or divide the numerator and denominator by the same non-zero number. Eg.

(i) $\frac{6}{7}=\frac{6\times2}{7\times2}=\frac{12}{14}=\frac{6\times3}{7\times3}=\frac{18}{21}....$

(ii) $\frac{12}{24}=\frac{12\div2}{24\div2}\left(=\frac{6}{12}\right)=\frac{12\div3}{24\div3}\left(=\frac{4}{8}\right)=\frac{12\div4}{24\div4}\left(=\frac{3}{6}\right)$

and so on.

Therefore, $\frac{12}{24},\frac{6}{12},\frac{4}{8},\frac{3}{6}$ are equivalent fractions.

SPOT LIGHT

When two fractions having the same numerators are compared, the fraction with the greater denominator will be the smaller fraction.

Quick Tips

- Both numerator and denominator may be multiplied by the same number without changing the fraction's value.

Be Alert !

- $\frac{5}{4}$ and $\frac{3}{4}$ are not equivalent fractions.

Building Concepts 2

$\frac{6}{11}=\frac{a}{33}=\frac{36}{b}$ Determine the values of a and b.

Explanation

Multiply the numerator and denominator of each equivalent fractions by the same whole number.

$\Rightarrow \frac{6}{11}=\frac{6\times3}{11\times3}=\frac{18}{33}\Rightarrow\frac{18}{33}=\frac{a}{33}$

$\therefore$ a = 18

$\Rightarrow \frac{6}{11}=\frac{6\times6}{11\times6}=\frac{36}{66}\Rightarrow\frac{36}{66}=\frac{36}{B}$

$\therefore$ b = 66

Numerical Ability 2

Are the following fractions equivalent?

(i) $\frac{1}{5}, \frac{5}{25}$ **(ii)** $\frac{3}{8}, \frac{10}{16}$

Solution

(i) $\frac{1}{5} = \frac{5}{25}$

$\Rightarrow$ Divide both numerator and denominator of $\frac{5}{25}$ by 5, so that both fractions have the same denominator.

$\Rightarrow$ $\frac{5}{25} = \frac{5 \div 5}{25 \div 5} = \frac{1}{5}$

$\Rightarrow$ Both the denominators and numerators are the same.

$\therefore$ $\frac{1}{5}$ and $\frac{5}{25}$ are equivalent.

(ii) Divide both numerator and denominator of $\frac{10}{16}$ by 2, so that both fractions have the same denominator.

$\Rightarrow$ $\frac{10}{16} = \frac{10 \div 2}{16 \div 2} = \frac{5}{8}$

$\Rightarrow$ The denominators are same, but the numerators are different.

$\therefore$ $\frac{3}{8}$ and $\frac{10}{16}$ are not equivalent.

When two fractions having the same denominators are compared, the fraction with the greater numerator will be the greater fraction.

SPOT LIGHT

Simplest form of a fraction

A fraction is said to be in simplest form or lowest terms if its numerator and denominator have no common factors except 1, i.e., the H.C.F. of the numerator and denominator is 1.

Method to reduce a fraction to its simplest form

Method 1

A given fraction is expressed in lowest terms by dividing the numerator and denominator by their H.C.F.

Building Concepts 3

Reduce $\frac{78}{144}$ into its simplest form.

Solution

$\Rightarrow$ In $\frac{78}{144}$, numerator = 78, denominator = 144

$\Rightarrow$ Prime factorising each of them,

$78 = 2 \times 3 \times 13$

$144 = 2 \times 2 \times 2 \times 2 \times 3 \times 3$

$\Rightarrow$ H. C. F. of 78 and 144 is $2 \times 3 = 6$

$\therefore \quad \frac{78}{144} = \frac{78 \div 6}{144 \div 6} = \frac{13}{24}$

$\Rightarrow$ Hence $\frac{78}{144}$ in its lowest terms = $\frac{13}{24}$

Method 2

The given fraction may also be expressed in lowest terms by cancelling or removing the common factors in steps.

Reduce $\frac{90}{126}$ to its lowest term.

Solution

$$\frac{90}{126} = \frac{90 \div 2}{126 \div 2} = \frac{45}{63} = \frac{45 \div 3}{63 \div 3} = \frac{15}{21} = \frac{15 \div 3}{21 \div 3} = \frac{5}{7}$$

We have divided first by the common factor 2 and then by 3 and again by 3. Now the fraction has no common factor left except 1.

$\frac{90}{126} = \frac{5}{7}$

1. Write equivalent fraction of $\frac{17}{15}$ with denominator 105.

2. Reduce the fraction $\frac{108}{24}$ in simplest form?

3. Check whether the fraction $\frac{60}{84}$ and $\frac{20}{28}$ are equivalent or not.

Types of fractions

Like fractions

The fractions having same denominators are called like fractions.

Eg. $\frac{7}{16}, \frac{8}{16}, \frac{9}{16}$ etc.

Unlike fractions

Fractions having different denominators are called unlike fractions.

Eg. $\frac{7}{9}, \frac{1}{3}, \frac{9}{4}$ etc.

SPOT LIGHT

Each proper fraction is less than 1.

Proper fractions

Fractions in which the numerator is less than the denominator are called proper fractions.

Eg. $\frac{7}{8}, \frac{1}{4}, \frac{9}{13}$ etc.

Improper fractions

Fractions in which the numerator is either equal to or greater than the denominator are called improper fractions.

Eg. $\frac{7}{7}, \frac{9}{4}, \frac{8}{3}$ etc.

Mixed fractions or mixed numbers

A mixed fraction consists of a natural number and a fractional part.

Eg. $4\frac{2}{7}, 1\frac{3}{4}, 7\frac{3}{8}$ etc.

In $7\frac{3}{8}$, 7 is the natural number and $\frac{3}{8}$ is the fractional part.

To convert a mixed fraction into an improper fraction

Multiply the whole number with the denominator of the fraction and to this product add the numerator of the fraction. Its denominator is the same as the denominator of the fractional part.

A mixed fraction = A natural number + A proper fraction

Eg. $7\frac{9}{11} = \frac{7\times 11+9}{11} = \frac{77+9}{11} = \frac{86}{11}$

To convert an improper fraction into a mixed fraction

$6\overline{)\,97}\,16$

-6

37

-36

1

Consider the improper fraction $\frac{97}{6}$. On dividing 97 by 6, the quotient = 16 and remainder = 1. Here the quotient becomes the whole number part and the remainder upon the divisor becomes fractional part.

$\therefore \frac{97}{6} = 16\frac{1}{6}$ $\left(\text{quotient}\ \frac{\text{remainder}}{\text{divisor}}\right)$

Be Alert !

- $\frac{3}{4}$ and $\frac{3}{7}$ are not like fractions.

Building Concepts 4

Classify as proper fractions, improper fractions and mixed numbers.

(i) $\frac{4}{9}$ **(ii)** $\frac{11}{8}$ **(iii)** $7\frac{4}{5}$ **(iv)** $\frac{14}{14}$

Explanation

Proper fractions : A fraction whose numerator is less than its denominator.

Improper fraction : A fraction whose numerator is equal to or greater than its denominator is called improper fraction

Mixed numbers : A fraction which consists of two parts (i) a natural number (ii) a proper fraction

(i) $\frac{4}{9} \Rightarrow 4 < 9$ i.e.; proper fraction

(ii) $\frac{11}{8} \Rightarrow 11 > 8$ i.e.; Improper fraction

(iii) $7\frac{4}{5} \Rightarrow 7$ is a natural number and $\frac{4}{5}$ is a proper fraction i.e., mixed fraction

(iv) $\frac{14}{14} \Rightarrow \frac{1}{1}$ = Improper fraction

Numerical Ability 4

Write each mixed number as an improper fraction.

(i) $7\frac{3}{4}$ **(ii)** $6\frac{4}{9}$ **(iii)** $11\frac{11}{13}$

Solution

To convert a mixed fraction into a improper fraction:

A mixed fraction = A natural number + A proper fraction

(i) $7\frac{3}{4} = \frac{7\times4+3}{4} = \frac{28+3}{4} = \frac{31}{4}$

(ii) $6\frac{4}{9} = 6+\frac{4}{9} = \frac{6\times9+4}{9} = \frac{54+4}{9} = \frac{58}{9}$

(iii) $11\frac{11}{13} = 11+\frac{11}{13} = \frac{13\times11+11}{13} = \frac{154}{13}$

Quick Tips

- $2\frac{2}{5} = 2+\frac{1}{5}$

Check your Answers 1

1. $\frac{119}{105}$ **2.** $\frac{9}{2}$ **3.** Yes, $\frac{60}{84}$ and $\frac{20}{28}$ are equivalent fractions.

Check your Concepts 2

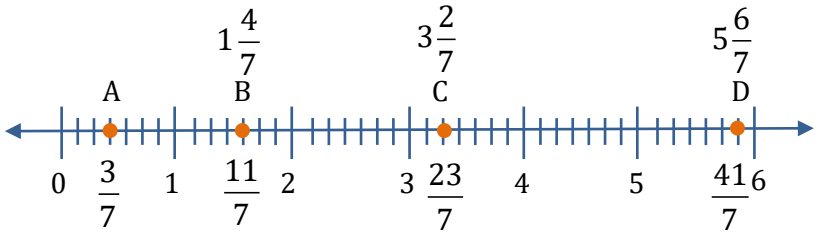
1. Classify as proper fraction, improper fraction and mixed number.

(i) $\frac{36}{7}$ (ii) $4\frac{9}{11}$ (iii) $\frac{48}{97}$

2. Write $11\frac{13}{6}$ into an improper fraction

Number line

Look at the number line. The gap between 0 and 1 is divided into 7 equal parts. Each part indicates $\frac{1}{7}$ of the whole gap. The point A indicates 3 parts out of 7 equal parts.



The point B represents 1 whole part (0 to 1) plus 4 equal parts out of 7 equal parts, i.e., it represents $1+\frac{4}{7}=1\frac{4}{7}$.

Similarly, point C represents the fraction $3\frac{2}{7}$ and point D the fraction $\frac{41}{7}$ or $5\frac{6}{7}$.

Building Concepts 5

In the above example, what fractions would A, B, C and D have represented if the gap between the whole numbers 0 and 1, 1 and 2, 2 and 3, and so on would have been divided into

(i) 9 equal parts (ii) 10 equal parts (iii) 20 equal parts ?

Explanation

(i) $A\to\frac{3}{9}, B\to1\frac{4}{9}, C\to3\frac{2}{9}, D\to5\frac{6}{9}$

(ii) $A\to\frac{3}{10}, B\to1\frac{4}{10}, C\to3\frac{2}{10}, D\to5\frac{6}{10}$

(iii) $A\to\frac{3}{20}, B\to1\frac{4}{20}, C\to3\frac{2}{20}, D\to5\frac{6}{20}$

Numerical Ability 5

Represent $2\frac{2}{5}$ on the number line.

Solution

Let OA = AB = BC = 1 unit.

Then, clearly, OB = 2 units and OC = 3 units.

Divide BC into 5 equal parts and take 2 parts out of them to reach the point P.

Clearly, P represents the number $2\frac{2}{5}$.

Any fractions with 1 as the numerator is called a unit fraction. Thus $\frac{1}{3}$ is called a unit fraction.

SPOT LIGHT

Check your Answers 2

1. (i) Improper fraction
(ii) Mixed number
(iii) Proper fraction

2. $\frac{79}{6}$

Comparison of fractions

General method of comparing two fractions

Method of cross multiplication

Let $\frac{a}{b}$ and $\frac{c}{d}$ be the two given fractions.

Cross multiply, as shown : $\frac{a}{b}\times\frac{c}{d}$

Find cross products ad and bc

(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 $\frac{a}{b}=\frac{c}{d}$

Method of converting the given fractions into like fractions

Change each one of the given fractions into an equivalent fraction with the denominator equal to the LCM of the denominators of the given fractions.

Now, the new fractions are like fractions which may be compared.

Building Concepts 6

Convert $\frac{2}{3}, \frac{3}{4}, \frac{4}{5}, \frac{7}{9}, \frac{1}{8}, \frac{7}{12}$ into a set of like fractions.

Explanation

We will convert each of the fractions into an equivalent fraction with denominator equal to the LCM of 3, 4, 5, 9, 8, 12.

LCM of 3, 4, 5, 9, 8, 12 = 2 × 2 × 3 × 5 × 3 × 2 = 360.

2	3, 4, 5, 9, 8, 12
2	3, 2, 5, 9, 4, 6
3	3, 1, 5, 9, 2, 3
2	1, 1, 5, 3, 2, 1
3	1, 1, 5, 3, 1, 1
5	1, 1, 5, 1, 1, 1
	1, 1, 1, 1, 1, 1

$\therefore \quad \frac{2}{3}=\frac{2\times120}{3\times120}=\frac{240}{360}$

$\frac{3}{4}=\frac{3\times90}{4\times90}=\frac{270}{360}, \quad \frac{4}{5}=\frac{4\times72}{5\times72}=\frac{288}{360}$

$\frac{7}{9}=\frac{7\times40}{9\times40}=\frac{280}{360}, \quad \frac{1}{8}=\frac{1\times45}{8\times45}=\frac{45}{360}$

$\frac{7}{12}=\frac{7\times30}{12\times30}=\frac{210}{360}$

$\therefore \quad \frac{240}{360}, \frac{270}{360}, \frac{288}{360}, \frac{280}{360}, \frac{45}{360}, \frac{210}{360}$ is the required set of like fractions.

Numerical Ability 6

Arrange the fractions $\frac{2}{3}, \frac{1}{6}, \frac{5}{9}$ and $\frac{7}{12}$ in ascending order.

Solution

The given fractions are $\frac{2}{3}, \frac{1}{6}, \frac{5}{9}$ and $\frac{7}{12}$

LCM of 3, 6, 9, 12 = (3 × 2 × 3 × 2) = 36

So, we convert each one of the given fractions into an equivalent fraction with denominator 36

3	3, 6, 9, 12
2	1, 2, 3, 4
2	1, 1, 3, 2
3	1, 1, 3, 1
	1, 1, 1, 1

Now, $\frac{2}{3}=\frac{2\times12}{3\times12}=\frac{24}{36}; \quad \frac{1}{6}=\frac{1\times6}{6\times6}=\frac{6}{36};$

$\frac{5}{9}=\frac{5\times4}{9\times4}=\frac{20}{36}$ and $\frac{7}{12}=\frac{7\times3}{12\times3}=\frac{21}{36}$

Clearly, $\frac{6}{36}<\frac{20}{36}<\frac{21}{36}<\frac{24}{36}$

$\therefore \quad \frac{1}{6}<\frac{5}{9}<\frac{7}{12}<\frac{2}{3}$

Hence, the given fractions in ascending order are $\frac{1}{6}, \frac{5}{9}, \frac{7}{12}, \frac{2}{3}$

SPOT LIGHT

A fraction of the form $\frac{p}{q}$, where p (say = $\frac{a}{b}$) and q(say= $\frac{c}{d}$) are fractions, is called a complex fraction.

Quick Tips

- To compare like fractions (with like denominators), just compare the numerators. In such a case, the fraction with a greater numerator is greater.
- To compare fractions with like numerators, compare the denominators. The fraction with a greater denominator is smaller.

Operations of fractions

Addition of fractions

(i) Sum of like fractions = $\frac{\text{Sum of their numerators}}{\text{Common denominator}}$

(ii) If the fractions are unlike fractions, then change the given fractions into equivalent like fractions and then add.

Building Concepts 7

Find the sum of:

(i) $\frac{3}{8}+\frac{1}{8}+\frac{5}{8}$

(ii) $\frac{5}{6}+\frac{7}{8}+\frac{11}{12}$

(iii) $2\frac{4}{5}+1\frac{3}{10}+3\frac{1}{15}$

SPOT LIGHT

The corresponding fractional names for, $\frac{1}{2},\frac{1}{4},\frac{2}{3},\frac{3}{5},\frac{5}{8}$ are one half, one quarter, two-third, three-fifth and five-eight respectively.

Explanation

(i) $\frac{3}{8}+\frac{1}{8}+\frac{5}{8}=\frac{3+1+5}{8}=\frac{9}{8}$

(ii) We have

LCM of 6, 8, 12 = (2 × 3 × 2 × 2) = 24

$\therefore \quad \frac{5}{6}+\frac{7}{8}+\frac{11}{12}=\frac{20+21+22}{24}$ $\left\{\begin{matrix}24\div6=4, & 4\times5=20\\ 24\div8=3, & 3\times7=21\\ 24\div12=2, & 2\times11=22\end{matrix}\right\}$

$=\frac{63}{24}=\frac{21}{8}=2\frac{5}{8}$

(iii) We have

$$2\frac{4}{5}+1\frac{3}{10}+3\frac{1}{15}$$

$$=\frac{14}{5}+\frac{13}{10}+\frac{46}{15}$$

LCM of 5, 10, 15 = (5 × 2 × 3) = 30

$$=\frac{84+39+92}{30}=\frac{215}{30}=\frac{43}{6}=7\frac{1}{6}\left\{\begin{array}{ll}30\div5=6, & 6\times14=84\\ 30\div10=3, & 3\times13=39\\ \text{and} & \\ 30\div15=2, & 2\times46=92\end{array}\right.$$

Numerical Ability 7

What is the value of $999\frac{1}{7}+999\frac{2}{7}+999\frac{3}{7}+999\frac{4}{7}+999\frac{5}{7}+999\frac{6}{7}$ when simplified?

Solution

$$999\frac{1}{7}+999\frac{2}{7}+999\frac{3}{7}+999\frac{4}{7}+999\frac{5}{7}+999\frac{6}{7}$$

$$=999+\frac{1}{7}+999+\frac{2}{7}+999+\frac{3}{7}+999+\frac{4}{7}+999+\frac{5}{7}+999+\frac{6}{7}$$

$$=999\times6+\left(\frac{1}{7}+\frac{2}{7}+\frac{3}{7}+\frac{4}{7}+\frac{5}{7}+\frac{6}{7}\right)$$

$$=5994+\frac{21}{7}=5994+3=5997$$

Every mixed number can be written as an improper fraction and every improper fraction can be written as a mixed number.

SPOT LIGHT

Be Alert !

★ $\frac{4}{7}+\frac{3}{5}\neq\frac{7}{12}$

Subtraction of fractions

(i) Subtraction of like fractions = $\frac{\text{(difference of their numerator)}}{\text{(common denominator)}}$

(ii) If the fractions are unlike fractions then change the given fractions into equivalent like fractions and then subtract.

Building Concepts 8

(i) Subtract : $\frac{11}{12}-\frac{19}{12}$

(ii) Subtract : $\frac{5}{12}$ from $\frac{7}{8}$

(iii) Simplify : $5\frac{1}{6}-3\frac{1}{4}+3\frac{1}{3}+4$

Solution

(i) $\frac{11}{12}-\frac{19}{12}=\frac{11-19}{12}=\frac{-8}{12}=\frac{-2}{3}$

(ii) LCM of 8 and 12 = (2 × 2 × 2 × 3) = 24

Now, $\frac{7}{8}=\frac{7\times3}{8\times3}=\frac{21}{24}$ and $\frac{5}{12}=\frac{5\times2}{12\times2}=\frac{10}{24}$

$\therefore \quad \frac{7}{8}-\frac{5}{12}=\frac{21}{24}-\frac{10}{24}=\frac{21-10}{24}=\frac{11}{24}$

(iii) We have

$5\frac{1}{6}-3\frac{1}{4}+3\frac{1}{3}+4$

$=\frac{31}{6}-\frac{13}{4}+\frac{10}{3}+\frac{4}{1}$

$=\frac{62-39+40+48}{12}=\frac{150-39}{12}$

$=\frac{111}{12}=\frac{37}{4}=9\frac{1}{4}$

Equivalent fractions can be found by multiplying or dividing the numerator and denominator of a fraction by the same non zero number.

SPOT LIGHT

Numerical Ability 8

To a number, $\left(\frac{1}{3}-\frac{1}{4}\right)$ is added. From the sum so obtained $\frac{1}{3}$ of $\frac{1}{4}$ is subtracted and the remainder is $\left(\frac{1}{3}+\frac{1}{4}\right)$. Find the number.

Solution

Let the number be x, then

$\left[x+\left(\frac{1}{3}-\frac{1}{4}\right)\right]-\frac{1}{3}\text{ of }\frac{1}{4}=\left(\frac{1}{3}+\frac{1}{4}\right)$

$\Rightarrow \quad x+\left(\frac{4-3}{12}\right)-\frac{1}{12}=\frac{4+3}{12}$

$\Rightarrow \quad x+\frac{1}{12}-\frac{1}{12}=\frac{7}{12}$

$\Rightarrow \quad x=\frac{7}{12}$

Word Problems

Building Concepts 9

If a man spends $\frac{5}{6}$ th part of money and then earns $\frac{1}{2}$ part of the remaining money, what part of his money is with him now?

Explanation

Let the money with the man at first be ₹ 1

$\therefore$ Money spent = $\frac{5}{6}$ of ₹1 = ₹$\frac{5}{6}$

Remaining money = $1 - \frac{5}{6}$ = ₹ $\frac{1}{6}$

Money earned = $\frac{1}{2}$ of ₹$\frac{1}{6}$ = ₹$\frac{1}{12}$

$\therefore$ Total money with him now = ₹$\frac{1}{6}$ + ₹$\frac{1}{12}$ = ₹$\frac{3}{12}$ = ₹$\frac{1}{4}$

$\therefore$ $\frac{1}{4}$ th part of the money is with him now.

SPOT LIGHT

A dyadic fraction is a vulgar fraction in which the denominator is a power of two.

e.g, $\frac{1}{8} = \frac{1}{2^3}$

Numerical Ability 9

My elder sister divided the watermelon into 16 parts. I ate 7 out of them. My friend ate 4. How much did we eat between us? How much more of the watermelon did I eat than my friend? What portion of the watermelon remained?

Solution

I ate = $\frac{7}{16}$

My friend ate = $\frac{4}{16}$

we both ate $\frac{7}{16}+\frac{4}{16}=\frac{7+4}{16}=\frac{11}{16}$

the watermelon more I eat than my friend is

$= \frac{7}{16}-\frac{4}{16}=\frac{7-4}{16}=\frac{3}{16}$

The portion of the watermelon remained

$= 1-\frac{11}{16}=\frac{16-11}{16}=\frac{5}{16}$

Numerical Ability 10

The food we eat remains in the stomach for a maximum of 4 hours. For what fraction of a day, does it remains there?

Solution

The food we eat remains in the stomach for maximum of 4 hours and total number of hours in a day is 24.

$\therefore$ The required fraction $\Rightarrow \frac{4}{24} = \frac{4 \div 4}{24 \div 4} = \frac{1}{6}$

Numerical Ability 11

It was estimated that because of people switching to Metro trains, about 33000 tonnes of CNG, 3300 tonnes of diesel and 21000 tonnes of petrol was saved by the end of year 2007. Find the fraction of :

(i) The quantity of diesel saved to the quantity of petrol saved.

(ii) The quantity of diesel saved to the quantity of CNG saved.

Solution

By the end of the year 2007 Metro trains was saved

33000 tonnes of CNG

3300 tonnes of diesel

21000 tonnes of petrol

(i) $\frac{\text{The quantity of diesel}}{\text{The quantity of petrol}} = \frac{3300}{21000} = \frac{3300 \div 300}{21000 \div 300} = \frac{11}{70}$

(ii) $\frac{\text{The quantity of diesel}}{\text{The quantity of CNG}} = \frac{3300}{33000} = \frac{3300 \div 3300}{33000 \div 3300} = \frac{1}{10}$

Memory Map

Fractions

Fractions are written in the form of a/b, where a and b are whole numbers and b ≠ 0.

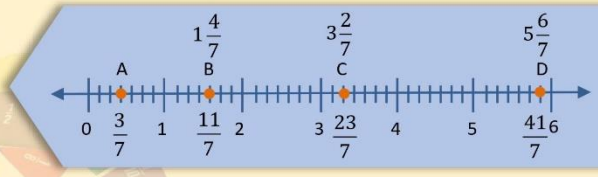
Types of fractions

- Proper fractions
- Improper fractions
- Mixed fractions
- Decimal fractions
- Unit fractions
- Simple fractions
- Like and unlike fractions

Reciprocal of a fraction

We can obtain the reciprocal of a given fraction by interchanging the numerator and denominator of the fraction.
Reciprocal of any non-zero fraction a/b ($a \neq 0, b \neq 0$) = b/a

Number line



Equivalent Fractions

Two or more fractions having the same value or representing the same part of a whole are called equivalent fractions.

$\frac{1}{2}=\frac{2}{4}=\frac{3}{6}=\frac{4}{8}=$ ..... .

Operations of fractions

Addition of fractions

Sum of like fractions = $\frac{\text{Sum of their numerators}}{\text{Common denominator}}$

Subtraction of fractions

Subtraction of like fractions = $\frac{\text{(difference of their numerator)}}{\text{(common denominator)}}$