BRIDGE COURSE
Class:VI
Sub:MATHEMATICS

NUMBER SYSTEM

Natural numbers

Natural numbers : Numbers which we use for counting the objects are known as natural numbers. They are denoted by 'N'. N = { 1, 2, 3, 4, 5,.....}

Properties of Natural numbers:

i)The first and the smallest natural number is 1.

ii) Everyy natural number (except 1) can be obtained by adding 1 to the previous natural number i.e., the difference between any two consecutive natural nmumbers is 1.

iii) For the natural number 1, there is no previous natural numer.

iv) There is no last or greatest natural number.

V) We cannot c omplete the counting of all natural numbers. We express this fact by saying that there are infinitely many natural numbers.

Whole numbers : All natural numbers together with zero are called whole numbers.

Whole numbers are denoted by 'W'. W = { 0, 1, 2, 3, 4, 5, ...}

Properties of Whole numbers:

i) The number zero is the first and the smallest whole number.

ii) There is no last or greastest whole number.

iii) There are infinitely many or uncountables number of whole numbers.

iv) All natural numbers are whole numbers.

v) All whole numbers are not natural numbers. For example , 0 is a whole number but it is not a natural number.

Integers : All natural numbers, 0 and negatives of counting numbers. i.e., { ...., –3, –2, –1, 0, 1, 2, 3, ...} together form the set of integers. Integers represented with I or Z

(i) Positive Integers : { 1, 2, 3, 4,...} is the set of all positive integers and represented with Z^+

(ii) Negative Integers :

{ –1, –2, –3,....} is the set of all negative integers and represented with Z^-

(iii) Non-Positive and Non-Negative Integers : 0 is neither positive nor negative.

So {0, 1, 2, 3, ...} represents the set of non-negative integers, while {0, –1, –2, –3, ...} represents the set of non-positive integers.

Properties of integers: Let a, b, c are integers. For addition, the following properties hold good.

1. **Closure property:** If a, b are integers, then a + b is an integer.
2. **Commutative law:** a + b = b + a
3. **Associative law:** a + (b + c) = (a + b) + c
4. **Existence of identity:** a + 0 = 0 + a = a. 0 is called additive identity.
5. **Additive inverse:** For any integer a, we have a + (-a) = (-a) + a = 0
   -a is called additive inverse of a.

Let a, b, c are integers. For multiplication, the following properties hold good.

1. **Closure property:** If a, b are integers, then a x b is an integer.
2. **Commutative law:** a x b = b x a
3. **Associative law:** a x (b x c) = (a x b) x c
4. **Existence of identity:** a x 1 = 1 x a = a. 1 is called multiplicative identity.
5. **Multiplicative inverse:** For any integer a, we have $a \times \frac{1}{a} = \frac{1}{a} \times a = 1$

   $\frac{1}{a}$ is called multiplicative inverse of a.
6. **Distributive law:**

   i) a x (b + c) = a x b + a x c. ii)(a + b) x c = a x c + b x c.

Note:

1. Product of two integers with unlike sign is always negative.
2. Product of two integers with like sign is always positive
3. Multiplication is nothing but repeated additon.

TEACHING Task

MCQ's Wwith single correct ansswer

1. Which of the following natural number does not have a predecessor.....
   A)1 B)2 C)3 D)4
2. A Natural number set along with 0 is called .....
   A)Natural numbers B)integers C)whole numbers D)numbers
3. Sum of two natural numbers is natural number is .....property
   A)Identity B)Inverse C)Associative D)Closure
4. In whole number system , 7 + 9 = 9 + 7 is .....property
   A)Closure B)Commutative C)Associative D)Inverse
5. Additive identity of 7 in Natural number is .....
   A)7 B)-7 C)1 D)Does not exists

6. Additive inverse of 9 in Natural numbers ....

A) $\frac{1}{9}$ B)-9 C)0 D)Does not exists

7. Multiplicative identity of 8 in Natural numbers.....

A) $\frac{1}{8}$ B)-8 C)1 D)Does not exists

8. In whole numbers, multiplicative inverse of 11 is .....

A) $\frac{1}{11}$ B)-11 C)1 D)Does not exists

9. 1 + (2 + 3) = (1 + 2) + 3 is .....property
A)Closure B)commutative C)Associative D)Inverse

10. Which of the following property satisfied by natural numbers under subtraction
A)Closure B)Commutative C)Associative D)None

11. Division of zero is .....
A)0 B)1 C)-1 D)Not defined

12. Zero is divided by any whole number is ....
A)0 B)1 C)-1 D)Not defined

13 x and y are the whole numbers then ' x + y ' is .....
A)Anatural number B)not a whole number C)a whole number D)not an integer

14. 21 X (5 + 6) = (21 X 5) + (21 X 6) is an example of .....
A) Closure property B) Associative property
C) Identity property D) Distributive property

15. The set of natural numbers not satisfies the the following property under addition
A)Closure B)Associative C)Identity D)Distributive

16 Which expression does not have the same value as the expression 5 X (4+17) =
A)5 X 21 B)5 X 4 +5 X 17 C)5 X 4 + 17 D)20 + 5 X 17

LEARNER'S TASK

Beginners (level-I)

I. MCQ's with single correct answers

1. The smallest natural number is .....
A)0 B)1 C)2 D)3

2. The greatest natural number is .....
A)1 B)100 C)1000 D)Can't say

3. Smallest whole number is ....
A)0 B)1 C)2 D)3

4. Additive identity of any whole number in set of whole numbers is.....
A)0 B)1 C)2 D)3

5. Additive inverse of any whole number in set of whole numbers is.....
A)0 B)1 C)2 D)Does not exists

6. In set of natural numbers 10 X 1 = 1 X 10 = 10 is a ....property
A) Associative B)Commutative under addition
C) Commutative under multiplication D)Identity property under multiplication

7. In set of whole number, 10 + 0 = 0 + 10 = 10 then '0' is called .....
A)Additive inverse B)multiplicative inverse
C)Additive identity D)multiplicative identity

8. The set of whole number satisfies the following property under addition
A)Closure B)Associative C)Identity D)All the above

9. (1 + 2) + 3 = ...
A) (1 x 2) x 3 B) (1 + 2) X 3 C) (1 X 2)+7 D)1+(2 +3)

10. In whole numbers, Multiplicative identity of 6 is.....
A)0 B)1 C)-1 D)Does not exists

Achievers (Level - II)

II. MCQ'S with more than one correct answers

11. The whole numbers do not satisfy closure property under.....
A) Addition B) Subtraction C) Multiplication D) Division

12. Which of the following statements is/are false.....
A) The difference between two whole numbers is a whole number.
B) '0' is the additive identity in the set of whole numbers.
C) '0' is the least number in the natural number system.
D) Whole numbers starts with 'one'.

13. Which of the follwing is true where a,b,c are Natural numbers....
A)a X b = b X a B)a + b = b + a C)a + (b + c) = (a + b) + c
D) a X (b X c) = (a X b) X c

III. Assertion & reasoning

A). Both Assertion & reason are true, reason is the correct explanation of Assertion.
B). Both Assertion & reason are true, reason is not correct explanation of Assertion
C). Assertion is true, reason is false. D). Assertion is false, reason is true.

14. A *:* Zero is the whole number but not a natural number.
R *:* W = {0, 1, 2, 3, ...}; N = {1, 2, 3, ...} .

15. A *:* Predecessor of 1 in the set of whole numbers is 0
R *:* Predecessor of a given number is obtained by subtracting one to the number.

IV. Comprehension paragrarh

I W = { 0, 1, 2, 3, 4, 5.....}

16. In the set of whole numbers, the valid operation among the following is.....
A) $12 \div 2 = 2 \div 12$ B) $12 - 2 = 2 - 12$ C) $0 + 8 = 8$ D) $3 \times 1 \neq 1 \times 3$

17. The property related to the given operation (7 + 0) = (0 + 7) in whole numbers is..
A) Commutative B) Associative C) Closure D) Distributive

18. Additive identity in whole numbers is equal to.....
A) –1 B) 1 C) 0 D) 2

II. For every whole number x, x + 0 = 0 + x = x
For every whole number y, $y \times 1 = 1 \times y = y$
If $x \times y = 0$, then either x = 0 (or) y = 0 (or) x = y = 0.

19. For any whole number y, y × 1 = 1 × y = y is known as _____
A) additive identity property B) multiplicative identity property
C) zero property D) commutative

20. Additive identity of whole numbers is.....
A) 1 B) 0 C) Both 1 & 2 D) 10

21. If x is a whole number and x + 3 = 2, then x =
A) 0 B) 1 C) 2 D) Does not exist

V. Match the following

22. i) additive identity of 'a' is ..... [ ] a) 1
ii) additive inverse of 'a' is ... [ ] b) 0
iii) multiplicative identity of 'a' is .. [ ] c) - a
iv) multiplicative inverse of 'a' is .. [ ] d) 1/a

Explorers (Level - III)

Solve the following

1. Find the value of 654 x (182 - 82)
2. Write the consertives after and before of 80009
3. Selly got 49 marks in Math, 39 marks in English, and 51 in Scinence. John got 62 marks in Math 32 in English and 54 in science what are their total marks.
4. The no.of students in each class of a school is 25. The fee paid by by each student is d 812 pre month. If there are 40 classes in a school. What is the total fee collection in a month.
5. Jai eats from a hotel which charges Rs. 55 for lunch and Rs. 40 for dinner. Find the money he has to pay for 7 days.

Key : Teaching Task : 1-A, 2-C, 3-D, 4-B, 5-D, 6-D, 7-D, 8-D 9-C, 10-D,
11-A, 12-A, 13-C, 14-D, 15-D, 16-C

Learner Task 1-B, 2-D, 3-A, 4-A, 5-D, 6-D, 7-C, 8-D, 9-D, 10-D

ii) 11-B,D 12-A,C & D 13.A,B,C,D

iii) 16-C, 17-A, 18-C, 19-B, 20- B, 21-D

HINTS AND SOLUTIONS

1. 654 X (182-82)
654x100 = 65400
2. After 80009 = 80010
before 80009 = 80008
3. Selly got = 49+39+51=139
John got = 62+32+54= 148
4. Total students = 40 x 25 = 1000
Total fee = 1000 x 812 = 812000
5. For lunch and dinner = 55+40 = 95
for 7 Total days = 95 x 7 = 665

Fractions

Fractions :

Fraction is **'a part of the wohle'**. Hence, we can say that each part is a fraction. Therefore we say that "A part of the whole is called Fraction."

Types of Fractions :

Decimal fraction : A fraction whose denominator is 10, 100, 1000 etc... is called decimal fraction. **Example** $\frac{3}{10}, \frac{9}{100}$ etc.

Vulgar Fraction : A fraction whose denominator is a whole number, other than 10, 100, 1000 etc... is called Vulgar fraction.

Proper Fraction : A fraction in which numerator is less than thedenominator is called a proper fraction. Ex : $\frac{1}{2}, \frac{3}{4}, \frac{7}{9}$

Improper Fraction : A Fracltion in which numerator is greater than the denominator is called an improper fraction. EX : $\frac{5}{2}, \frac{9}{4}, \frac{10}{11}$

Mixed Fraction (compound Fraction): The combination of a whole number with a proper fraction is called Mixed fraction Ex : $1\frac{1}{2}, 7\frac{3}{4}$

Equivalent Fractions : Fractions that represent the same part are called equivalent fractions. Ex : $\frac{1}{4}\ and\ \frac{2}{8}; \frac{1}{3}\ and\ \frac{4}{12}; \frac{6}{10}\ and\ \frac{3}{5}; \frac{10}{100} and\ \frac{1}{10}$

Like Fractions : Fractions that have the same denominators are called like fractions.

Ex : i) $\frac{1}{4}\ and\ \frac{2}{8}$ are like fractions, they have the same denominator

ii) $\frac{2}{7}, \frac{3}{7}, \frac{5}{7}$ are like fractions, they have the same denominator

Unlike Fractions : Fraction that have different denominators are called unlike fractions.

Ex : $\frac{1}{4}\ and\ \frac{2}{3}$

Unit Fractions : Fractions which have one as numerator are called as unit fractions.

Complex Fractions: Fraction whose one or both are terms are fractions is called a complex fraction.

Comparison of fractions : By cross multiplication : If two fractions $\frac{a}{b}\ and\ \frac{c}{d}$ are to be compared, we cross multiply i) $if\quad a\times d > b\times c,\ then\ \frac{a}{b} > \frac{c}{d}$

ii) $if\quad a\times d < b\times c,\ then\ \frac{a}{b} < \frac{c}{d}$ iii) $if\quad a\times d = b\times c,\ then\ \frac{a}{b} = \frac{c}{d}$

Ex : Compare the $\frac{2}{3}\ and\ \frac{5}{6}$

Solution : On cross multoplication we get 2 x 6 and 3 x 5 $\Rightarrow$ 12 and 15 $\Rightarrow$ 12 12<15

$$\therefore \frac{2}{3} < \frac{5}{6}$$

By taking the L.C.M Taking the L.C.M of the deonominatior of the given fraction convert each of the fraction into an equivalent fraction with denominator equal to the L.C.M compare thier numerators. the higher the value of the numeratory the greater is the fraction

Ex : Arrragne $\frac{2}{5}, \frac{1}{4}, \frac{3}{2}, \frac{5}{10}$ in ascending order

soluction : The L.C.M of 5,4,2,10,= 20

$$\frac{2}{5} = \frac{2\times 4}{5\times 4} = \frac{8}{20},\ \ \frac{1}{4} = \frac{1\times 5}{4\times 5} = \frac{5}{20}, \frac{3}{2}$$

Now $= \frac{3\times 10}{2\times 10} = \frac{30}{20},\ \ \frac{9}{10} = \frac{9\times 2}{10\times 2} = \frac{18}{20}$

Now compare the numerators of like fractions $\frac{8}{20}, \frac{5}{20}, \frac{30}{20}, \frac{18}{20}$

Arranging them in ascending order, we get $\frac{5}{20} < \frac{8}{20} < \frac{18}{20} < \frac{30}{20}$

so, $\frac{1}{4} < \frac{2}{5} < \frac{9}{10} < \frac{3}{2}$

TEACHING Task

MCQ's with single correct answer

1. If $\frac{5}{20} = \frac{x}{40}$, then x =.....

   A) 5 B) 10 C) 15 D) 20

2. An equivalent fraction for $\frac{8}{24}$ is

   A) $\frac{2}{6}$ B) $\frac{3}{9}$ C) both A & B D) $\frac{2}{3}$

3. In an exam a student scored 25 marks out of 50 marks then the fraction of marks secured is .....

   A) $\frac{1}{2}$ B) $\frac{1}{3}$ C) $\frac{1}{4}$ D) $\frac{1}{5}$

4. Improper from of $3\frac{5}{7}$ is.....

   A) $\frac{25}{7}$ B) $\frac{26}{7}$ C) $\frac{27}{7}$ D) $\frac{29}{7}$

5. Simplest form of $\frac{24}{78}$ is

A) $\frac{4}{13}$ B) $\frac{12}{13}$ C) $\frac{3}{16}$ D) $\frac{2}{19}$

6. The Fraction $\frac{3x+6}{3}$ equal to, for x = 7 is .....

A)7 B)8 C)9 D)none

7. Compare $\frac{2}{3}$ and $\frac{3}{4}$ is .....

A) $\frac{2}{3} < \frac{3}{4}$ B) $\frac{2}{3} > \frac{3}{4}$ C) $\frac{2}{3} = \frac{3}{4}$ D) Both 1 & 3

8. Re.1 as fraction of Rs. 100 is.....

A) $\frac{1}{10}$ B) $\frac{2}{100}$ C) $\frac{3}{100}$ D) $\frac{1}{100}$

9. 250 gms as fraction of 1 kg is

A) $\frac{1}{5}$ B) $\frac{1}{4}$ C) $\frac{3}{4}$ D) $\frac{4}{3}$

10. Ascending order of $\frac{2}{3}$, $\frac{1}{2}$ and $\frac{1}{6}$

A) $\frac{1}{6}, \frac{1}{2}, \frac{2}{3}$ B) $\frac{2}{3}, \frac{1}{6}, \frac{1}{2}$ C) $\frac{1}{6}, \frac{2}{3}, \frac{1}{2}$ D) $\frac{2}{3}, \frac{1}{2}, \frac{1}{6}$

11. Greatest among $-\frac{3}{2}, \frac{3}{2}, \frac{11}{4}, \frac{5}{2}$ is

A) $\frac{3}{2}$ B) $\frac{11}{4}$ C) $-\frac{3}{2}$ D) $\frac{5}{2}$

12. The smallest fraction among the following is

A) $\frac{5}{12}$ B) $\frac{7}{12}$ C) $\frac{8}{12}$ D) $\frac{11}{12}$

LEARNER'S Task

Beginners (Level - I)

I. MCQ's with single correct answer

1 In a fraction $\frac{a}{b}$, b is called

A) Numerator B) Denominator C) Decimals D) Fractions

2. Fraction of whose dinominators are 10 , 100, 1000.....etc are called
A) Vulgar fraction B) Improper fraction C) Proper fraction D) Decimal fraction

3. If the numerator of a fraction is less than its denominator , then the fraction is
   A) Proper fraction B) Improper farction
   C) Vulgar fraction D) Decimal fraction
4. Which among the following is mixed as well as proper fraction

   A) $2\frac{1}{5}$ B) $\frac{7}{6}$ C) $\frac{23}{21}$ D) none
5. A fraction whcih can be expressed as the sum of a natural number and a proper fraction is called.....
   A)Complex fraction B)Simple fraction
   C)mixed fraction D)proper fraction
6. While converting the unlike fractions into like fractions we find
   A) H.C.F of denominators B) Sum of denominators
   C) L.C.M of numerators D) L.C.M of denominators
7. Fractions having the same denominators are called
   A)simple fractions B)same fractions
   C)Like fractions D)proper fractions
8. If both numberator and denominator of a fraction are mlitplied by the same positive constant, then the fraction obtained is called
   A)like fraction B)equivalent fraction
   C)decimal fraction D)square fraction
9. The fraction $\frac{3}{8}$ is an example of

   A)Vulgar fraction B) Decimals fraction
   C)Irreducible form D) Both A and C
10. $\frac{6}{25}$ and $\frac{7}{25}$ are example of

    A) Unlike fractions B) like fraction C) Irreducible fraction D) Both B & C
11. A fraction greater than $\frac{7}{3}$ is .....

    A) $\frac{2}{3}$ B) $\frac{4}{3}$ C) $\frac{3}{2}$ D) $\frac{9}{2}$
12. A fraction less than $\frac{3}{5}$ from the given is

    A) $\frac{5}{8}$ B) $\frac{4}{5}$ C) $\frac{1}{3}$ D) $\frac{3}{4}$
13. Descending order of $\frac{2}{5}$, $\frac{1}{3}$ and $\frac{3}{7}$ is

    A) $\frac{2}{5}$, $\frac{1}{3}$, $\frac{3}{7}$ B) $\frac{1}{3}$, $\frac{2}{5}$, $\frac{3}{7}$ C) $\frac{3}{7}$,$\frac{2}{5}$, $\frac{1}{3}$ D) $\frac{3}{7}$,$\frac{1}{3}$, $\frac{2}{5}$

14. The ascending order of $\frac{3}{2}, \frac{5}{2}, \frac{9}{2}$ is

A) $\frac{3}{2} < \frac{5}{2} < \frac{9}{2}$ B) $\frac{5}{2} < \frac{9}{2} < \frac{3}{2}$ C) $\frac{9}{2} < \frac{3}{2} < \frac{5}{2}$ D) $\frac{7}{2} < \frac{3}{2} < \frac{5}{2}$

15. The descending order of $\frac{5}{3}, \frac{2}{3}, \frac{1}{3}$ is

A) $\frac{5}{3} < \frac{2}{3} < \frac{1}{3}$ B) $\frac{5}{3} > \frac{2}{3} > \frac{1}{3}$ c) $\frac{1}{3} > \frac{5}{3} > \frac{2}{3}$ D) $\frac{2}{3} > \frac{1}{3} > \frac{5}{3}$

16. The fraction $\frac{1}{12}$ is

A) $> \frac{7}{12}$ B) $< \frac{7}{12}$ C) $= \frac{8}{12}$ D) $\frac{11}{12}$

Achievers (Level - II)

I. MCQ's with multi correct answer

17. Which of the following fractions are less than $\frac{5}{9}$?

A) $\frac{11}{18}$ B) $\frac{13}{24}$ C) $\frac{17}{36}$ D) $\frac{5}{8}$

18. Which of the following is / are true

A) $\frac{3}{5} < \frac{5}{8}$ B) $\frac{7}{10} < \frac{5}{7}$ C) $\frac{2}{3} < \frac{7}{10}$ D) $\frac{4}{35} > \frac{5}{7}$

II. Assertion and Reasoning type questions:

a) Both A and R are correct and R is correct explanation of A.
b) Both A and R are correct and R is not correct explanation of A.
c) A is correct and R is incorrect. d) A is incorrect and R is correct.

19. A : Fractions having the same denominators but different numerators are unlike fractions.

R : $\frac{2}{3}, \frac{3}{4}, \frac{5}{8}, \frac{6}{11}$ are unlike fractions

III. Comprehension Type : $\frac{5}{20}, \frac{x-2}{40}$ are two farctions

20. If $\frac{5}{20} = \frac{x-2}{40}$, then the value of x is.....

A)12 B)13 C)14 D)none

21. The mixed fraction of $\frac{3 \times x + 3}{6} =$.....

A) $6\frac{1}{2}$ B) $6\frac{1}{3}$ C) $6\frac{1}{4}$ D) $6\frac{1}{5}$

22. If $\frac{x-10}{2}$ =.....

A)1 B)2 c)3 d) none

IV. Match the following

23.

Column - I		**Column - II**
i) 35 paise as fraction of Rs 1	[ ]	a) $\frac{7}{20}$
ii) 75 cm as fraction of 2 metres	[ ]	b) $\frac{3}{8}$
iii) 16 hours as a fraction of 1 day	[ ]	c) $\frac{2}{3}$
iv) 250 gm as a fraction of 3 kg	[ ]	d) $\frac{1}{12}$
		e) $\frac{4}{15}$

Explorers (Level - III)

Solve the following

1. A ribbon of length $5\frac{1}{4}$ m is cut into small pieces each of length $\frac{3}{4}$ m . find the number of pieces.
2. One packet of biscuits requires $2\frac{1}{2}$ cups of flour and $1\frac{2}{3}$ cups of sugar. Estimate total quantity of both ingredients used in 10 such packet of biscuits.
3. $\frac{4}{5}$ of 5 kg apples were used on monday. The next day $\frac{1}{3}$ of what was left was used. find the weight of apples left.
4. If $\frac{2}{3}$ of a number is 10. then what is 1.75 times of that number?
5. Kajol has Rs.75 this is $\frac{3}{8}$ of the amount she earned. How much did she earn ?
6. $\frac{1}{8}$ of a Number is equal to $\frac{2}{5} \div \frac{1}{20}$. What is that number.

Key : Lecture Task :1-B 2-C 3-A 4-B 5-A 6-C 7-A 8-D 9-D 10-A 11-B 12-A

student task: 1-B 2-D 3-A 4-D 5-C 6-A 7-C 8-B 9-D 10-B 11-D 12-C 13-C 14-A 15-B 16-B 17-B,C 18-A,B,C 19-D 20-A 21-A 22-A

HINTS AND SOLUTIONS

1. Total length of ribbon = $5\frac{1}{4}=\frac{21}{4}$

   Each piece length = $\frac{3}{4}$

   No. of pieces = $\frac{21}{4}\times\frac{4}{3}=7$

2. No. of cups of floor = $2\frac{1}{2}=\frac{5}{2}$

   No. of cups of sugar = $1\frac{2}{3}=\frac{5}{3}$

   floor and sugar for each cup = $\frac{5}{2}+\frac{5}{3}=\frac{25}{6}$

   floor and sugar for 10 cups = $\frac{25}{6}\times 10=\frac{250}{6}$

3. No. of apples used on monday = $\frac{4}{5}of\ 5kg=\frac{4}{5}\times 5000=4Kg$

   Next day 1/3 of what was left (1000g = 1 kg) = $\frac{1}{3}X1000=0.33kg$

   Total used = (4+0.33) kg
   weight of apples left = 5kg - 4.33kg = 0.67 kg

4. $\frac{2}{3}\times x=10\Rightarrow x=15$

   1.75 times of that number = 1.75 x 15 = 26.25

5. Let the earned money = x

   $\frac{3}{8}\times x=75\Rightarrow x=200$

6. $\frac{1}{8}\times x=\frac{2}{5}\times\frac{20}{1}\Rightarrow x=64$

Finding fractions between to given fractions:

If $\frac{a}{b}and\frac{c}{d}$ are two fractions, then the fraction lying between them is $\frac{a+c}{b+d}$

Thus, we have $\frac{a}{b},\frac{a+c}{b+d},\frac{c}{d}$ we can find other fractions similarly.

Fundamental operations on fractions

Addition : While adding like terms, add the numerators and retain the common denominator.

In, greneral $\frac{a}{b}+\frac{c}{b}=\frac{a+c}{b}$

Note : While adding unlike terms, first convert them into like fractions and then add as like fractions.

Properties of additon of fractions :

Commutative property :If $\frac{a}{b} and \frac{c}{d}$ are two frctions then $\frac{a}{b}+\frac{c}{d}=\frac{c}{d}+\frac{a}{b}$

Associative property : If $\frac{a}{b},\frac{c}{d} and \frac{e}{f}$ are three fractions then

$$\frac{a}{b}+\left(\frac{c}{d}+\frac{e}{f}\right)=\left(\frac{a}{b}+\frac{c}{d}\right)+\frac{e}{f}$$

Subtraction : While subtracting like terms, subtracting the numberators and retain the common denominator.

In, general $\frac{a}{b}-\frac{c}{b}=\frac{a-c}{b}$

Note : While subtracting unlike terms, first convert them into like fractions and find difference as in like fractions.

Multiplication of fractions : If $\frac{a}{b} and \frac{c}{d}$ are two fractions, then the product of these

fractions = $\frac{a\times c}{b\times d}=\frac{product\ of\ their\ numerators}{product\ of\ their\ deno\min ators}$

Properties of Multiplication of fractions

Commutative property : If are two fractions $\frac{a}{b}\ and\ \frac{c}{d}$ are two fractions, then

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

Associative property : If $\frac{a}{b},\frac{c}{d} and \frac{e}{f}$ are three fractions,

then $\frac{a}{b}\times\left(\frac{c}{d}\times\frac{e}{f}\right)=\left(\frac{a}{b}\times\frac{c}{d}\right)\times\frac{e}{f}$

Reciprocal of fraction : If $\frac{a}{b}$ is a fraction, then the reciprocal of this non- zero fraction is

$$\frac{b}{a}$$

Division of fractions : If $\frac{a}{b}$ and $\frac{c}{d}$ are two fractions, then $\frac{a}{b}\div\frac{c}{d}=\frac{a}{b}\times\frac{d}{c}$

TEACHING Task

MCQ's with single correct answer

1. $\frac{1}{3}+\frac{2}{3}=$

   A)1 B)$\frac{5}{5}$ C)$\frac{3}{5}+\frac{2}{5}$ D)all the above

2. $\frac{3}{5}-\frac{2}{5}=$.....

   A) $\frac{3}{5}$ B)$\frac{1}{5}$ C)$\frac{2}{5}$ D) $\frac{4}{5}$

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

   A)$\frac{19}{3}$ B)$\frac{20}{3}$ C)$\frac{13}{3}$ D)none

4. Product of $\frac{2}{3}$ *and* $\frac{3}{2}$ is .....

   A) 0 B) 1 C)$\frac{2}{3}$ D)$\frac{3}{2}$

5. Reciprocal of $\frac{1}{2017}$ is....

   A) 2017 B) $-\frac{1}{2017}$ C) -2017 D)none

6. Product of $\frac{20}{39}$ and reciprocal of $\frac{4}{13}$ is

   A) 1 B)$\frac{5}{3}$ C) $\frac{3}{5}$ D)$\frac{80}{39}$

7. The value of $\frac{2}{3}\div\frac{3}{2}$ is

   A)1 B)$\frac{3}{2}$ C)$\frac{4}{9}$ D)$\frac{4}{3}$

8. The value of $\frac{3}{4}$ *of* $\frac{8}{6}$ is

   A)1 B)$\frac{3}{4}$ C)$\frac{4}{3}$ D)$\frac{1}{2}$

9. The value of $1\frac{1}{3}\div\frac{5}{3}$ *of* $\frac{15}{12}$

A)1 B)-1 C) $\frac{15}{12}$ D)3

10. If $\frac{3}{7}$ of a number is 27, then the number is

A)60 B)61 C)62 D)63

11. If $\frac{3}{4}$ of a number is 27, then the number is .....

A)27 B)30 C) 36 D)39

12. A fraction between $\frac{1}{2}$ and $\frac{2}{3}$ is.....

A) $\frac{1}{4}$ B) $\frac{1}{5}$ C) $\frac{2}{5}$ D) $\frac{3}{5}$

13. Two fractions between $\frac{1}{2}$ and $\frac{3}{4}$ are

A) $\frac{3}{5},\frac{4}{3}$ B) $\frac{2}{3},\frac{3}{5}$ C) $\frac{1}{3},\frac{2}{3}$ D) $\frac{1}{5},\frac{3}{5}$

14. $2\frac{1}{3}-3\frac{1}{2}$ =.....

A) $\frac{-7}{6}$ B) $\frac{7}{6}$ C) $-\frac{5}{6}$ D) $\frac{5}{7}$

15. Product of $\frac{1}{5}\ and\ \frac{3}{6}\ is$.....

A) $\frac{3}{30}$ B) $\frac{1}{10}$ C)both A & B D) $\frac{3}{6}$

LEARNER'S Task

Beginners (Level - I)

I. MCQ's with single correct answer

1. The product of $\frac{5}{14}$, $\frac{10}{4}$ is.....

A)0 B)1 C) $\frac{1}{2}$ D) $\frac{5}{3}\ and\ \frac{9}{7}$

2.. $2\frac{5}{14}\div 9\frac{3}{7}$ =.....

A) $\frac{1}{2}$ B)3 C)4 D) $\frac{1}{4}$

3. If $\frac{4}{7}+\frac{2}{7}=\frac{y}{21}$, then y = ...

A)18 B)6 C)20 D)2

4. If $2\frac{1}{2}+3\frac{1}{2}+4\frac{1}{2}=x,\ \ then\ x-5\frac{1}{2}$

A)6 B)5 C)4 D)8

5. If $\frac{1}{4}$ part is equal to 3, then $\frac{3}{4}$ part equal to

A)4 B)6 C)9 D)8

6. $If\ \frac{c}{d}=1\div\frac{3}{4},\ then\ \frac{5}{6}+\frac{c}{d}$

A) $\frac{13}{3}$ B) $\frac{13}{2}$ C) $\frac{13}{4}$ D) $\frac{13}{6}$

7. One fraction between $\frac{2}{3} and\ \frac{3}{4}\ is$

A) $\frac{2}{7}$ B) $\frac{5}{6}$ C) $\frac{5}{7}$ D) $\frac{1}{7}$

8. Two fractions $\frac{7}{10},\frac{9}{17}$ are between which of the following.

A) $\frac{2}{3} and \frac{5}{7}$ B) $\frac{2}{3} and \frac{9}{5}$ C) $\frac{3}{7} and \frac{7}{3}$ D) $\frac{5}{3} and \frac{9}{7}$

8. After inserting two fractions in between $\frac{1}{2}\ and\ \frac{2}{3}$ the least one is

A) $\frac{3}{5}$ B) $\frac{4}{7}$ C) $\frac{5}{8}$ D) $\frac{4}{3}$

9. $If\ \frac{3}{x}\times\frac{8}{69}\times\frac{12}{9}=\frac{4}{3}\ and\ \frac{2}{7}\times\frac{y}{9}\times\frac{27}{4}=3,\ then\ \frac{x}{y}$ is a reciprocal of

A) $\frac{7}{2}$ B) $\frac{2}{7}$ C) $\frac{14}{8}$ D) $\frac{8}{14}$

Achievers (Level - II)

I. MCQ's with more than one correct answer

11. If $\frac{1}{8}$ of a pencil is black, $\frac{1}{2}$ of the remainging is white and the remaining $\frac{7}{2}$ cm is blue, then the total length of the pencil is

A)5 cm B) 8cm C) 80mm D) 50cm

12. What fraction of a 1275 is 816.

A) $\frac{48}{72}$ B) $\frac{16}{24}$ C) $\frac{48}{75}$ D) $\frac{16}{25}$

13. *If* $2\frac{1}{3}+3\frac{4}{3}+10\frac{1}{3}=y$ then y = ...

A)15 B) $6\frac{45}{3}$ C)17 D) $\frac{5\ 1}{3}$

II. Assertion and Reasoning type questions:

a) Both A and R are correct and R is correct explanation of A.
b) Both A and R are correct and R is not correct explanation of A.
c) A is correct and R is incorrect. d) A is incorrect and R is correct.

14. A : A boy wrote a fraction $\frac{3}{2}$ instead of $\frac{2}{3}$ he made a mistake of $\frac{7}{3}$

R : $\frac{x}{y}-\frac{y}{x}=\frac{x\times x-y\times y}{xy}$

15. A :If $x=\frac{8}{9}-\frac{5}{9}, y=\frac{5}{9}-\frac{1}{9} and\ z=\frac{7}{9}-\frac{1}{9},\ then\ x+y+z=\frac{11}{9}$

R : $\frac{a}{t},\frac{b}{t},\frac{c}{t}$ are proper fractions, then the sum of the fractions is $\frac{a+b+c}{t}$

III. Comprehension Type

i) If $\frac{11}{x},\frac{10}{x},\frac{9}{x} are\ \ fractions$

16. If $\frac{11}{x}+\frac{10}{x}+\frac{9}{x}=3,$ then the value of x is

A)9 B)10 C)11 D)12

17. If $\frac{11}{x}+\frac{9}{x}$ is simplified, then the answer is

A) 3 B) 2 C) 6 D) none

18. If $\left(\frac{11}{x}-\frac{9}{x}\right)+\frac{1}{6}$ simplifed, then the answer is

A) $\frac{1}{3}$ B) $\frac{11}{30}$ C) $\frac{12}{10}$ D)none

ii) A bus starts with full of passengers. At the first station, it drops 1/3 of the passengers. and takes 1/8 of the passangers at the beginning. At the second stop it drops 1/2 of the new total. At the third and last station it drops remaining (bus capacity 48)

19. How many passengers it takes at first station

A)5 B)6 C)7 D)8

20. How many passengers it downs at second station

A)16 B)17 C)18 D)19

21. How many passengers it drops at last

A)15 B)16 C)18 D)19

IV. Match the following

22.

Cloumn - I		**Cloumn - II**
i) commutative $\frac{1}{5}+\frac{2}{5}$ is	[ ]	a) $\left(\frac{7}{3}+\frac{15}{4}\right)+\frac{9}{5}$
ii) commutative $\frac{1}{4}+\frac{2}{5}$ is	[ ]	b) $\left(\frac{10}{3}+\frac{15}{4}\right)+\frac{9}{5}$
iii)associative of $\frac{10}{3}+\left(\frac{15}{4}+\frac{9}{5}\right)$ is	[ ]	c) $\frac{2}{5}+\frac{1}{5}$
iv) associative of $\frac{7}{3}+\left(\frac{15}{4}+\frac{9}{5}\right)$ is	[ ]	d) $\frac{2}{5}+\frac{1}{4}$

Explorers (Level - III)

Slove the following

1. The sum of three sides of a triangle is $16\frac{3}{5}$ cm. If two of its sides measure $5\frac{7}{10} cm \ and \ 6\frac{3}{4}$ cm respectivley, then find the length of the third side.

2. Find the result obtained after subtracting the sum of $9\frac{3}{4} \ and \ 5\frac{5}{6}$ from the sum of $11\frac{2}{5} \ and \ 7\frac{1}{3}$.

3. If $\frac{3}{4}$ of a number exceeds its $\frac{2}{3}$ by 6, then find the number.

4. x and y are reciprocals of $\frac{5}{6} \ and \ \frac{3}{4}$. $If \ x \div y \ of \ x \times y = z,$ then find the value of z

5. How many times should $\frac{1}{7}$ be added to $\frac{1}{7}$ so that the answer will be 2

6. $If \ \frac{x+13}{y-14}=\frac{20}{31} \ then \ find \ \frac{x+1}{y+3}$

Key :Teaching task 1-B 2-B 3-D 4-B 5-A 6-B 7-C 8-A 9-A 10-D 11-C 12-D 13-B 14-A 15-C

Learner's task : 1-D 2-D 3-A 4- B 5-C 6-D 7-C 8-A 9-B 10-A 11-B,C 12-C,D 13-C,D 14-A 15-D 16-B 17-B 18-B 19-B 20-D 21-D

HINTS AND SOLUTIONS

1. Sum of three sides = $16\frac{3}{5}=\frac{83}{5}$

$5\frac{7}{10}+6\frac{3}{4}+z=\frac{83}{5}$

$z=\frac{83}{5}-\frac{149}{20}$

$z=9\frac{3}{20}$

2. $sum of\ 9\frac{3}{4}\ and\ 5\frac{5}{6}=\frac{39}{4}+\frac{35}{6}$

$\Rightarrow\frac{117+70}{12}\Rightarrow\frac{187}{12}$

$sum\ \ of\ 11\frac{2}{5}\ and\ 7\frac{1}{3}=\frac{57}{5}+\frac{22}{3}$

$\Rightarrow\frac{171+110}{15}\Rightarrow\frac{281}{15}$

$subtraction\ \ of\ \frac{281}{15}-\frac{187}{12}$

$\Rightarrow\frac{3372-2805}{60}=\frac{567}{60}$

3. $\frac{3}{4}x+\frac{2}{3}x=6$

$\Rightarrow\frac{9x+8x}{12}=6$

$\Rightarrow x=\frac{72}{17}$

$x=\frac{6}{5},\ y=\frac{4}{3}$

$\frac{x}{y}\ of\ x\times y\Rightarrow x^2=z$

4. $\Rightarrow z=\left(\frac{6}{5}\right)^2$

$\Rightarrow z=\frac{36}{25}$

5.

$$\frac{x}{7}+\frac{1}{7}=2$$

$$\Rightarrow \frac{x}{7}=2-\frac{1}{7}$$

$$\Rightarrow x=13$$

6.

x+13 = 20 $\Rightarrow$ x=7

y-14 = 31 $\Rightarrow$ y = 45

$$\frac{x+1}{y+3}=\frac{8}{48}$$