RATIONAL NUMBERS

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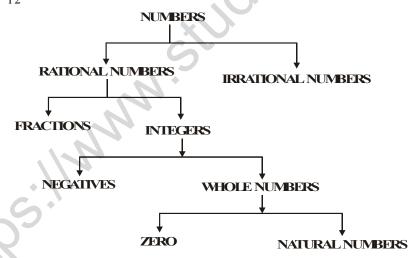
A number which can be written as $\frac{p}{q}$, where p, q, are integers and q 10, is called a rational number Thus, an integer divided by a non-zero integer is called rational number.

Ex.
$$\frac{2}{3}, \frac{37}{15}, \frac{-17}{19}, -3, 0, 10, 4.33, 7.123123123...$$

 $\frac{2}{3}, \frac{37}{15}, \frac{-17}{19}, -3, 0, 10, 4.33, 7.123123123.....$ In rational number $\frac{p}{q}$, p is called first integer or **numerator** and q the **second integer** or **denominator**.

- **(l)** Positive rational numbers: A rational number is said to be positive, if its numerator and denominator are either both positive or both negative
- $\frac{5}{7}$ and $\frac{-2}{-3}$ are both positive rational numbers. Ex.
- Negative rational numbers: A rational number is said to be negative, if its numerator and denominator are of (II)opposite sign $\frac{-4}{9}$ and $\frac{5}{-12}$ are negative rational numbers,
- **Equivalent rational numbers**: If $\frac{a}{b}$ is a rational number and m is a nonzero integer then $\frac{a}{b} = \frac{a \times m}{b \times m}$

Ex.
$$-\frac{3}{4} = \frac{-3 \times 2}{4 \times 2} = \frac{-3 \times 3}{4 \times 3} = \dots$$
$$-\frac{3}{4} = \frac{-6}{8} = \frac{-9}{12} = \dots$$
Such rational number are called equivalent rational numbers.



Natural Numbers (N) : The counting numbers 1, 2, 3, are known as natural numbers. N = (1, 2, 3, 4,)



- (i) The set N is infinite i.e. it has unlimited members.
- (ii) N has the smallest element namely '1'.
- N has no largest element. i.e., give me any natural number, we can find the bigger number (iii) from the given number.
- N does not contain '0' as a member. i.e. '0' is not a member of the set N. (iv)

- (b) Whole Numbers (W)
- : The number '0' together with the natural numbers 1, 2, 3, are known as whole numbers.



$W = (0, 1, 2, 3, 4, \dots)$



- (i) The set of whole number is infinite (unlimited elements).
- (ii) This set has the smallest members as '0'. i.e. '0' the smallest whole number. i.e., set W contain '0'

as a member.

- (iii) The set of whole numbers has no largest member.
- (iv) Every natural number is a whole number.
 - (v) Non-zero smallest whole number is '1

(c) Integers (I or Z)

: All natural numbers, 0 and negative of natural numbers are called integers.

 $I = \{-4, \dots, -3, -2, -1, 0, 1, 2, 3 \dots \}$

Positive integers

: (1, 2, 3, 4,); Negative integers : (...-4, -3, -2, -1)



- (i) This set Z is infinite.
- (ii) It has neither the greatest nor the least element.
- (iii) Every natural and every whole number is an integer.
- (iv) The set of non-negative integer = $\{0, 1, 2, 3, 4, ...\}$
- (v) The set of non-positive integer = $\{.....-4, -3, -2, -1, 0\}$

NATURAL NUMBERS, WHOLE NUMBERS, INTEGERS AND FRACTION AS RATIONAL NUMBERS

(i) Since a natural number $n = \frac{n}{1} = \frac{an integer}{a non - zero integer}$

every natural number is a rational number.

- (ii) Now, $0 = \frac{0}{\text{any non zero integer}}$, and is therefore a rational number.
 - All natural numbers and 0 being rational numbers imply,

all whole numbers are rational numbers.

(iii) Any integer (... –3, –2, –1, 0, 1, 2, 3,) can be written as $\frac{p}{q}$.

where p is the given integer and q = 1 is the non-zero integer.

Thus, every integer is a rational number.

(iv) A fraction = $\frac{x}{y}$, where x and y are natural numbers i.e., positive integer.



Thus, every fraction = $\frac{\text{an integer}}{\text{a non zero integer}}$ and is a rational number.

- (i) Every natural number, whole number and integer is a rational number.
- (ii) Every terminating decimal is a rational number.
- (iii) Every non-terminating repeating (recurring) decimal is a rational number.
- (iv) Between any two rational numbers there are an infinite number of rational numbers.

 This property is known as the density of rational numbers.

PROPERTIES OF RATIONAL NUMBERS

(I) If
$$\frac{a}{b}$$
 and $\frac{c}{d}$ are two rational numbers then $\frac{a}{b} + \frac{c}{d} = \frac{ad + bc}{bd}$

(II) If
$$\frac{a}{b}$$
 and $\frac{c}{d}$ are two rational numbers then $\frac{a}{b} \times \frac{c}{d} = \frac{a \times c}{b \times d}$

(III) If
$$\frac{a}{b}$$
 and $\frac{c}{d}$ (10) are two rational numbers, then $\frac{a}{b}$, $\frac{c}{d} = \frac{a}{b} \times \frac{d}{c} = \frac{ad}{bc}$

(IV) if
$$\frac{a}{b}$$
, $\frac{c}{d}$ and $\frac{e}{f}$ are three rational numbers then $\frac{a}{b} \times \left(\frac{c}{d} + \frac{e}{f}\right) = \left(\frac{a}{b} \times \frac{c}{d}\right) + \left(\frac{a}{b} \times \frac{e}{f}\right)$ and

$$\frac{a}{b} \times \left(\frac{c}{d} - \frac{e}{f}\right) = \left(\frac{a}{b} \times \frac{c}{d}\right) - \left(\frac{a}{b} \times \frac{e}{f}\right)$$
 (Distributive property of multiplication over addition and subtraction)

(V) If
$$\frac{a}{b}$$
 and $\frac{c}{d}$ be two rational number then $\frac{a}{b} = \frac{c}{d}$ \triangleright a × d = b × c

(VI) Absolute value of a rational number
$$\left| -\frac{x}{y} \right| = \frac{x}{y}$$
 and $\left| \frac{x}{y} \right| = \frac{x}{y}$

RECIPROCAL OR MULTIPLICATIVE INVERSE AND ADDITIVE INVERSE

(i) Reciprocal: Every non-zero rational number
$$\frac{a}{b}$$
 has its multiplicative inverse $\frac{b}{a}$

Thus $\left(\frac{a}{b} \times \frac{b}{a}\right) = \left(\frac{b}{a} \times \frac{a}{b}\right) = 1$ $\Rightarrow \frac{b}{a}$ is called the reciprocal of $\frac{a}{b}$

(ii) Multiplicative inverse: We denote the reciprocal of
$$\frac{a}{b}$$
 by $\left(\frac{a}{b}\right)^{-1}$ Clearly $\left(\frac{a}{b}\right)^{-1} = \frac{b}{a}$

(iii) Additive Inverse : For every rational number
$$\frac{a}{b}$$
 , there exists a rational number $\frac{-a}{b}$

such that
$$\left(\frac{a}{b} + \frac{-a}{b}\right) = \frac{a + (-a)}{b} = \frac{0}{b} = 0$$
 and $\left(-\frac{a}{b} + \frac{a}{b}\right) = 0$

 $-\frac{a}{b}$ is called the **additive inverse** of $\frac{a}{b}$

Ex.
$$\left(\frac{4}{7} + \frac{-4}{7}\right) = \frac{\{4 + (-4)\}}{7} = \frac{0}{7} = 0$$
 and similarly, $\left(\frac{-4}{7} + \frac{4}{7}\right) = 0$

$$\left(\frac{4}{7} + \frac{-4}{7}\right) = \left(\frac{-4}{7} + \frac{4}{7}\right) = 0$$

Thus, $\frac{4}{7}$ and $\frac{-4}{7}$ are additive inverses of each other.

Ex. Find the Reciprocal of –3 and $\frac{-8}{9}$, since

$$\left(-3 \times \frac{-1}{3}\right) = \left(\frac{-3}{1} \times \frac{-1}{3}\right) = \frac{(-3) \times (-1)}{1 \times 3} = \frac{3}{3} = 1$$

and Reciprocal of $\frac{-8}{9}$ is $\frac{-9}{8}$, since $\left(\frac{-8}{9} \times \frac{-9}{8}\right) = \left(\frac{-9}{8} \times \frac{-8}{9}\right) = 1$

Ex. Find the additive inverse of :

- (a) $\frac{5}{9}$
- **(b)** $\frac{-15}{8}$
- (c) $\frac{-6}{-7}$

Sol. (a) Additive inverse of $\frac{5}{9}$ is $\frac{-5}{9}$

- **(b)** Additive inverse of $\frac{-15}{8}$ is $\frac{15}{8}$
- (c) We may write, $\frac{-6}{-7} = \frac{(-6) \times (-1)}{(-7) \times (-1)} = \frac{6}{7}$. Hence, its additive inverse is $\frac{-6}{7}$

DO YOUR SELF



Write the additive inverse of (a) $\frac{-10}{31}$ (b) $\frac{4}{-15}$ (c) $\frac{-2}{-7}$ (d) $\frac{15}{9}$

Find the reciprocal of each of the following: (a) 12 (b) -8 (c) $\frac{5}{16}$ (d) $\frac{-14}{17}$ (e) $\frac{0}{2}$

ADDITIVE IDENTITY AND MULTIPLICATIVE IDENTITY

(i) Additive identity: 0 is a rational number such that the sum of any rational number and 0 is the rational number it self.

Thus
$$\left(\frac{a}{b}+0\right)=\left(0+\frac{a}{b}\right)=\frac{a}{b}$$
, for every rational number $\frac{a}{b}$

 $\boldsymbol{0}$ is called the $\boldsymbol{additive}$ identity for rationals.

(ii) Multiplicative Identity: For any rational number $\frac{a}{b}$, we have $\left(\frac{a}{b} \times 1\right) = \left(1 \times \frac{a}{b}\right) = \frac{a}{b}$

1 is called the multiplicative identity for rationals.

Ex. (i)
$$\left(\frac{3}{5} + 0\right) = \left(\frac{3}{5} + \frac{0}{5}\right) = \frac{3}{5}$$
 and similarly, $\left(0 + \frac{3}{5}\right) = \frac{3}{5}$

$$\left(\frac{3}{5} + 0\right) = \left(0 + \frac{3}{5}\right) = \frac{3}{5}$$

(ii)
$$\left(\frac{-2}{3}+0\right) = \left(\frac{-2}{3}+\frac{0}{3}\right) = \frac{(-2+0)}{3} = \frac{-2}{3}$$
 and similarly, $\left(0+\frac{-2}{3}\right) = \frac{-2}{3}$

$$\left(\frac{-2}{3}+0\right) = \left(0+\frac{-2}{3}\right) = \frac{-2}{3}$$

Ex. (i) Consider the rational number $\frac{3}{4}$. Then, we have

$$\left(\frac{3}{4} \times 1\right) = \left(\frac{3}{4} \times \frac{1}{1}\right) = \frac{(3 \times 1)}{(4 \times 1)} = \frac{3}{4} \text{ and } \left(1 \times \frac{3}{4}\right) = \left(\frac{1}{1} \times \frac{3}{4}\right) = \frac{(1 \times 3)}{(1 \times 4)} = \frac{3}{4}.$$

Consider the rational number $\frac{-9}{13}$. Then, we have

$$\frac{-9}{13} \times 1 = \left(\frac{-9}{13} \times \frac{1}{1}\right) = \frac{(-9) \times 1}{13 \times 1} = \frac{-9}{13}. \text{ and } \left(1 \times \frac{-9}{13}\right) = \left(\frac{1}{1} \times \frac{-9}{13}\right) = \frac{(1) \times (-9)}{1 \times 13} = \frac{-9}{13}$$

$$\left(\frac{-9}{13} \times 1\right) = \left(1 \times \frac{-9}{13}\right) = \frac{-9}{13}$$

PROPERTIES OF ADDITION, SUBTRACTION, MULTIPLICATION & DIVISION OF RATIONAL NUMBER

Properties	Addition	Subtraction	Multiplication	D ivis io n		
Closure property	(x+y) is a lways a rational number	(x – y) is a lwa ys a rational number	x × y is always a rational number	$x \div y$ and $y \ne 0$ then is always a rational number		
Commutative property	x + y = y + x	$(x-y)\neq (y-x)$	$x \times y = y \times x$	$x \div y \neq y \div x$		
Associative property	x + (y + z) = (x + y) + z	$x - (y - z) \neq (x - y) - z$	$x \times (y \times z) = (x \times y) \times z$	$x \div (y \div z) \neq (x \div y) \div z$		

Note: x, y & z are rational numbers.

- ADDITION OF RATIONAL NUMBERS : We define $\left(\frac{a}{h} + \frac{c}{h}\right) = \frac{a+c}{h}$
- Find the sum:

(i)
$$\frac{7}{9} + \frac{-11}{9}$$
 (ii) $\frac{8}{-11} + \frac{3}{11}$

(ii)
$$\frac{8}{-11} + \frac{3}{11}$$

Sol. We have

(i)
$$\frac{7}{9} + \frac{-11}{9} = \frac{7 + (-11)}{9} = \frac{-4}{9}$$
.

(ii)
$$\frac{8}{-11} = \frac{8 \times (-1)}{(-11) \times (-1)} = \frac{-8}{11}$$
.

$$\sqrt{\left(\frac{8}{-11} + \frac{3}{11}\right)} = \left(\frac{-8}{11} + \frac{3}{11}\right) = \frac{(-8) + 3}{11} = \frac{-5}{11}$$

PROPERTIES OF ADDITION OF RATIONAL NUMBERS

- (a) (Closure property): The sum of two rational numbers is always a rational number. If $\frac{a}{b}$ and $\frac{c}{d}$ are any two rational numbers, then $\left(\frac{a}{b} + \frac{c}{d}\right)$ is also a rational number.
- Ex. Consider the rational number $\frac{1}{3}$ and $\frac{3}{4}$. Then
- **Sol.** $\left(\frac{1}{3} + \frac{3}{4}\right) = \left(\frac{4+9}{12}\right) = \frac{13}{12}$, which is a rational number.
- Ex. Consider the rational number $\frac{-2}{3}$ and $\frac{4}{5}$. Then,
- **Sol.** $\left(\frac{-2}{3} + \frac{4}{5}\right) = \frac{(-10 + 12)}{15} = \frac{2}{15}$, which is a rational number.
- (b) (Commutative law): Two rational numbers can be added in any order. Thus for any two rational numbers $\frac{a}{b}$ and $\frac{c}{d}$, we have $\left(\frac{a}{b} + \frac{c}{d}\right) = \left(\frac{c}{d} + \frac{a}{b}\right)$
- Ex. (i) $\left(\frac{1}{2} + \frac{3}{4}\right) = \frac{(2+3)}{4} = \frac{5}{4} \text{ and } \left(\frac{3}{4} + \frac{1}{2}\right) = \frac{(3+2)}{4} = \frac{5}{4}$ $\sqrt{\left(\frac{1}{2} + \frac{3}{4}\right)} = \left(\frac{3}{4} + \frac{1}{2}\right).$
 - (ii) $\frac{-1}{2} + \frac{-2}{3} = \frac{(-3) + (-4)}{6} = \frac{-7}{6} \text{ and } \left(\frac{-2}{3} + \frac{-1}{2}\right) = \left\{\frac{\{(-4) + (-3)\}}{6}\right\} = \frac{-7}{6}$ $\left(\frac{-1}{2} + \frac{-2}{3}\right) = \left(\frac{-2}{3} + \frac{-1}{2}\right) \Rightarrow \text{LHS} = \text{RHS}$
 - (c) (Associative law): While adding three rational numbers, they can be grouped in any order thus for any three rational number $\frac{a}{b}$, $\frac{c}{d}$ and $\frac{e}{f}$ we have $\left(\frac{a}{b} + \frac{c}{d}\right) + \frac{e}{f} = \frac{a}{b} + \left(\frac{c}{d} + \frac{e}{f}\right)$
- Ex. Consider three rational numbers $\frac{-2}{3}$, $\frac{5}{7}$ and $\frac{1}{6}$ then,
- Sol. $\left\{ \left(\frac{-2}{3} + \frac{5}{7} \right) + \frac{1}{6} \right\} = \left\{ \frac{(-14+15)}{21} + \frac{1}{6} \right\} = \left(\frac{1}{21} + \frac{1}{6} \right) = \frac{(2+7)}{42} = \frac{9}{42} = \frac{3}{14}$ and $\left\{ \frac{-2}{3} + \left(\frac{5}{7} + \frac{1}{6} \right) \right\} = \left[\frac{-2}{3} + \frac{(30+7)}{42} \right] = \left[\frac{-2}{3} + \frac{37}{42} \right] = \frac{(-28+37)}{42} = \frac{9}{42} = \frac{3}{14}$

$$\left\{ \left(\frac{-2}{3} + \frac{5}{7} \right) + \frac{1}{6} \right\} = \left\{ \frac{-2}{5} + \left(\frac{5}{7} + \frac{1}{6} \right) \right\}$$
 Þ LHS = RHS

SUBTRACTION OF RATIONAL NUMBERS:

For rational numbers $\frac{a}{b}$ and $\frac{c}{d}$, we define $\left(\frac{a}{b} - \frac{c}{d}\right) = \frac{a}{b} + \left(\frac{-c}{d}\right) = \frac{a}{b} + \left(additive \ inverse \ of \frac{c}{d}\right)$

Ex. (i) Subtract
$$\frac{3}{4}$$
 from $\frac{2}{3}$ (ii) Subtract $\frac{-5}{7}$ from $\frac{-2}{5}$

Sol. (i)
$$\left(\frac{2}{3} - \frac{3}{4}\right) = \frac{2}{3} + \left(\text{additive inverse of } \frac{3}{4}\right) = \left(\frac{2}{3} + \frac{-3}{4}\right) = \frac{(8 + (-9))}{12} = \frac{-1}{12}$$

(ii)
$$\left\{ \frac{-2}{5} - \left(\frac{-5}{7} \right) \right\} = \frac{-2}{5} + \left(\text{additive inverse of } \frac{-5}{7} \right)$$
$$= \left(\frac{-2}{5} + \frac{5}{7} \right) \quad \left[\text{Q additive inverse of } \frac{-5}{7} \text{ is } \frac{5}{7} \right]$$
$$= \frac{(-14 + 25)}{35} = \frac{11}{35}$$

Ex. The sum of two rational numbers is –5. If one of them is
$$\frac{-13}{6}$$
 . Find the other

$$x + \left(\frac{-13}{6}\right) = -5$$

$$\Rightarrow x = -5 - \left(\text{additive inverse of } \frac{-13}{6} \right)$$

$$\Rightarrow x = \left(-5 + \frac{13}{6}\right) = \left(\frac{-5}{1} + \frac{13}{6}\right) = \frac{(-30 + 13)}{6}$$

$$\Rightarrow$$
 x = $\frac{-17}{6}$. Hence, the required number is $\frac{-17}{6}$

PROPERTIES OF SUBTRACTION OF RATIONAL NUMBERS

(a) (Closure property): If
$$\frac{a}{b}$$
 and $\frac{c}{d}$ are any two rational numbers, then $\frac{a}{b} - \frac{c}{d}$ is a rational number.

Ex. Consider the rational number
$$\frac{2}{3}$$
 and $\frac{1}{5}$

Sol.
$$\frac{2}{3} - \frac{1}{5} = \frac{10-3}{15} = \frac{7}{15}$$

(b) (Commutative law): The subtraction of rational numbers is not always commutative. That is for any two rational number
$$\frac{a}{b}$$
 and $\frac{c}{d}$. We have $\frac{a}{b} - \frac{c}{d} \cdot \frac{c}{d} - \frac{a}{b}$

Ex.
$$\frac{2}{3} - \frac{1}{4} \cdot \frac{1}{4} - \frac{2}{3}$$

Sol.
$$\frac{2}{3} - \frac{1}{4} = \frac{8-3}{12} = \frac{5}{12}$$
 $\Rightarrow \frac{1}{4} - \frac{2}{3} = \frac{3-8}{12} = \frac{-5}{12}$ $\Rightarrow \frac{2}{3} - \frac{1}{4} \cdot \frac{1}{4} - \frac{2}{3}$

 $\Rightarrow \frac{5}{12} \neq -\frac{5}{12}$ (Subtraction is not commutative for rational numbers.) LHS ¹ RHS

Ex.
$$\frac{2}{5} - \frac{3}{4} + \frac{3}{4} - \frac{2}{5}$$
 $\Rightarrow \frac{2}{5} - \frac{3}{4} = \frac{8-15}{20} = \frac{-7}{20}$ $\Rightarrow \frac{3}{4} - \frac{2}{5} = \frac{15-8}{20} = \frac{7}{20}$

$$\frac{2}{5} - \frac{3}{4} + \frac{3}{4} - \frac{2}{5} \Rightarrow -\frac{7}{20} \neq \frac{7}{20}$$
 (Subtraction is not commutative for rational numbers.)

(c) (Associative law): The subtraction of rational number is not associative i.e. for any three rational numbers $\frac{a}{b}$, $\frac{c}{d}$ and $\frac{e}{f}$ we have $\left(\frac{a}{b} - \frac{c}{d}\right) - \frac{e}{f} + \frac{a}{b} - \left(\frac{c}{d} - \frac{e}{f}\right)$

Ex.
$$\left(\frac{2}{3} - \frac{4}{5}\right) - \frac{1}{2} = \left(\frac{10 - 12}{15}\right) - \frac{1}{2}$$
 $\Rightarrow \frac{-2}{15} - \frac{1}{2} = \frac{-4 - 15}{30} = \frac{-19}{30}$

$$\frac{2}{3} - \left(\frac{4}{5} - \frac{1}{2}\right) = \frac{2}{3} - \left(\frac{8 - 5}{10}\right) \qquad \triangleright \quad \frac{2}{3} - \frac{3}{10} = \frac{20 - 9}{30} = \frac{11}{30}$$

(d) (Existence of right Identity): The rational number 0 is the right identity. That is, for any rational number $\frac{a}{b}$, we have $\frac{a}{b} - 0 = \frac{a}{b}$

Ex.
$$\frac{3}{5} - 0 = \frac{3}{5}$$

MULTIPLICATION OF RATIONAL NUMBER:

For any two rational numbers $\frac{a}{b}$ and $\frac{c}{d}$, we define : $\left(\frac{a}{b} \times \frac{c}{d}\right) = \left(\frac{a \times c}{b \times d}\right)$

Ex. (i)
$$\frac{2}{3} \times \frac{-5}{7}$$
 (ii) $\frac{-7}{8} \times \frac{3}{5}$

Sol. We have :

(i)
$$\frac{2}{3} \times \frac{-5}{7} = \frac{2 \times (-5)}{3 \times 7} = \frac{-10}{21}$$

(ii)
$$\frac{-7}{8} \times \frac{3}{5} = \frac{(-7) \times 3}{8 \times 5} = \frac{-21}{40}$$

Ex. (i)
$$\frac{-3}{7} \times \frac{14}{5}$$
 (ii) $\frac{13}{6} \times \frac{-18}{91}$

Sol. We have:

(i)
$$\frac{-3}{7} \times \frac{14}{5} = \frac{(-3) \times 14}{7 \times 5} = \frac{-6}{5}$$

(ii)
$$\frac{13}{6} \times \frac{-18}{91} = \frac{13 \times (-18)}{6 \times 91} = \frac{-3}{7}$$

PROPERTIES OF MULTIPLICATION OF RATIONAL NUMBERS

- (a) (Closure Property): The product of two rational numbers is always a rational number. If $\frac{a}{b}$ and $\frac{c}{d}$ are any two rational numbers than $\left(\frac{a}{b} \times \frac{c}{d}\right)$ is also a rational number.
- Ex. (i) Consider the rational numbers $\frac{1}{2}$ and $\frac{5}{7}$. Then, $\left(\frac{1}{2} \times \frac{5}{7}\right) = \frac{(1 \times 5)}{(2 \times 7)} = \frac{5}{14}$, which is a rational number.
 - (ii) Consider the rational numbers $\frac{-3}{7}$ and $\frac{5}{14}$. Then, $\left(\frac{-3}{7} \times \frac{5}{14}\right) = \frac{(-3) \times 5}{7 \times 14} = \frac{-15}{98}$, which is a rational number.
- (b) (Commutative law): Two rational numbers can be multiplied in any order. Thus, for any rational number $\frac{a}{b} \text{ and } \frac{c}{d} \text{ . We have } \left(\frac{a}{b} \times \frac{c}{d} \right) = \left(\frac{c}{d} \times \frac{a}{b} \right)$
- Ex. (i) Let us consider the rational numbers $\frac{3}{4}$ and $\frac{5}{7}$. Then,

$$\left(\frac{3}{4} \times \frac{5}{7}\right) = \frac{(3 \times 5)}{(4 \times 7)} = \frac{15}{28}$$
 and $\left(\frac{5}{7} \times \frac{3}{4}\right) = \frac{(5 \times 3)}{(7 \times 4)} = \frac{15}{28}$

$$\left(\frac{3}{4} \times \frac{5}{7} \right) = \left(\frac{5}{7} \times \frac{3}{4} \right) \triangleright LHS = RHS$$

(ii) Let us consider the rational numbers $\frac{-2}{5}$ and $\frac{6}{7}$. Then,

$$\left(\frac{-2}{5} \times \frac{6}{7}\right) = \frac{(-2) \times (6)}{5 \times 7} = \frac{-12}{35} \quad \text{and} \quad \left(\frac{6}{7} \times \frac{-2}{5}\right) = \frac{6 \times (-2)}{7 \times 5} = \frac{-12}{35}$$

$$\left(\frac{-2}{5} \times \frac{6}{7}\right) = \left(\frac{6}{7} \times \frac{-2}{5}\right) \Rightarrow LHS = RHS$$

(c) (Associative law): While multiplying three or more rational numbers, they can be grouped in any order.

Thus, for any rational numbers
$$\frac{a}{b}$$
, $\frac{c}{d}$ and $\frac{e}{f}$, we have $\left(\frac{a}{b} \times \frac{c}{d}\right) \times \left(\frac{e}{f}\right) = \frac{a}{b} \times \left(\frac{c}{d} \times \frac{e}{f}\right)$

Ex. Consider the rational numbers $\frac{-5}{2}$, $\frac{-7}{4}$ and $\frac{1}{3}$. We have

Sol.
$$\left(\frac{-5}{2} \times \frac{-7}{4}\right) \times \frac{1}{3} = \left\{\frac{(-5) \times (-7)}{2 \times 4} \times \frac{1}{3}\right\} = \left(\frac{35}{8} \times \frac{1}{3}\right) = \frac{(35 \times 1)}{(8 \times 3)} = \frac{35}{24}$$

and $\frac{-5}{2} \times \left(\frac{-7}{4} \times \frac{1}{3}\right) = \frac{-5}{2} \times \frac{(-7) \times 1}{4 \times 3} = \left(\frac{-5}{2} \times \frac{-7}{12}\right) = \frac{(-5) \times (-7)}{(2 \times 12)} = \frac{35}{24}$.

(f) (Distributive law of multiplication over addition):

 $\Rightarrow \frac{35}{24} = \frac{35}{24} \Rightarrow LHS = RHS$

For any three rational numbers $\frac{a}{b}\,,\,\frac{c}{d}\,$ and $\frac{e}{f},$

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

Ex. Consider the rational numbers $\frac{-3}{4}$, $\frac{2}{3}$ and $\frac{-5}{6}$. We have

(g) (Multiplicative property of 0) : For any rational number $\frac{a}{b}$,

we have
$$\left(\frac{\mathbf{a}}{\mathbf{b}} \times \mathbf{0}\right) = \left(\mathbf{0} \times \frac{\mathbf{a}}{\mathbf{b}}\right) = \mathbf{0}$$

Ex. (i) $\left(\frac{5}{18} \times 0\right) = \left(\frac{5}{18} \times \frac{0}{1}\right) = \frac{(5 \times 0)}{(18 \times 1)} = \frac{0}{18} = 0$. Similarly, $\left(0 \times \frac{5}{18}\right) = 0$

(ii) $\left(\frac{-12}{17} \times 0\right) = \left(\frac{-12}{17} \times \frac{0}{1}\right) = \frac{(-12) \times 0}{17 \times 1} = \frac{0}{17} = 0$. Similarly, $\left(0 \times \frac{-12}{17}\right) = 0$

DO YOUR SELF



Verify the following statements : (a) $\left(\frac{7}{9} - \frac{11}{12}\right) + \frac{2}{3} = \frac{7}{9} - \left(\frac{11}{12} + \frac{2}{3}\right)$ (b) $\frac{3}{4}\left(\frac{2}{3} - \frac{1}{4}\right) = \frac{3}{4} \times \frac{2}{3} - \frac{3}{4} \times \frac{1}{4}$ (c) $\left(\frac{2}{3} \div \frac{3}{-5}\right) \div \frac{1}{2} = \frac{2}{3} \div \left(\frac{3}{-5} \div \frac{1}{2}\right)$ (d) Find $\frac{2}{5} \times \frac{-3}{7} - \frac{1}{14} - \frac{3}{7} \times \frac{3}{5}$

If $\frac{a}{b}$ and $\frac{c}{d}$ are two rational numbers such that $\frac{c}{d}$ 10,

we define $\left(\frac{a}{b} \div \frac{c}{d}\right) = \left(\frac{a}{b} \times \frac{d}{c}\right)$ when $\frac{a}{b}$ is divided by $\frac{c}{d}$, then $\frac{a}{b}$ is called the **dividend**; $\frac{c}{d}$ is called the divisor and the result is known as quotient.

Ex. Divide,

(i)
$$\frac{9}{16}$$
 by $\frac{5}{8}$

(ii)
$$\frac{-6}{25}$$
 by $\frac{3}{5}$

(iii)
$$\frac{11}{24}$$
 by $\frac{-5}{8}$

(i)
$$\frac{9}{16}$$
 by $\frac{5}{8}$ (ii) $\frac{-6}{25}$ by $\frac{3}{5}$ (iii) $\frac{11}{24}$ by $\frac{-5}{8}$ (iv) $\frac{-9}{40}$ by $\frac{-3}{8}$

Sol. (i)
$$\frac{9}{16} \div \frac{5}{8} = \frac{9}{16} \times \frac{8}{5} = \frac{9 \times 8}{16 \times 5} = \frac{72}{80} = \frac{9}{10}$$
 (ii) $\frac{-6}{25} \div \frac{3}{5} = \frac{-6}{25} \times \frac{5}{3} = \frac{(-6) \times 5}{25 \times 3} = \frac{-30}{75} = \frac{-2}{5}$

(ii)
$$\frac{-6}{25} \div \frac{3}{5} = \frac{-6}{25} \times \frac{5}{3} = \frac{(-6) \times 5}{25 \times 3} = \frac{-30}{75} = \frac{-2}{5}$$

(iii)
$$\frac{11}{24} \div \frac{-5}{8} = \frac{11}{24} \times \frac{8}{-5} = \frac{11 \times 8}{24 \times (-5)} = \frac{88}{-120} = \frac{-11}{15}$$
 (iv) $\frac{-9}{40} \div \frac{-3}{8} = \frac{-9}{40} \times \frac{8}{-3} = \frac{(-9) \times 8}{40 \times (-3)} = \frac{-72}{-120} = \frac{3}{5}$

(iv)
$$\frac{-9}{40} \div \frac{-3}{8} = \frac{-9}{40} \times \frac{8}{-3} = \frac{(-9) \times 8}{40 \times (-3)} = \frac{-72}{-120} = \frac{3}{5}$$

The product of two numbers is $\frac{-28}{27}$. If one of the numbers is $\frac{-4}{9}$. Find the other.

$$x \times \frac{-4}{9} = \frac{-28}{27}$$

$$\Rightarrow$$
 $x = \frac{-28}{27} \div \frac{-4}{9} = \frac{-28}{27} \times \frac{9}{-4}$

$$x = \frac{28 \times 9}{27 \times 4} = \frac{7}{3}$$
.

b $x = \frac{28 \times 9}{27 \times 4} = \frac{7}{3}$. Hence, the other number is $\frac{7}{3}$.

Ex.3 Fill in the blanks:
$$\frac{27}{16} \div (....) = \frac{-15}{8}$$

Sol. Let
$$\frac{27}{16} \div \left(\frac{a}{b}\right) = \frac{-15}{8}$$
 . Then,

$$\frac{27}{16} \times \frac{b}{a} = \frac{-15}{8} \triangleright \frac{b}{a} = \frac{-15}{8} \times \frac{16}{27} = \frac{-10}{9} \triangleright \frac{a}{b} = \frac{9}{-10}$$

Hence, the missing number is $\frac{-9}{10}$

PROPERTIES OF DIVISION OF RATIONAL NUMBERS

Closure property: If $\frac{a}{b}$ and $\frac{c}{d}$ are any two rational numbers such that $\frac{c}{d}$ of then $\frac{a}{b} \div \frac{c}{d}$ is also a rational numbers.

Ex.
$$\frac{-6}{9} \div \frac{15}{-18}$$

Sol. We have
$$\begin{array}{c} -6 & 15 \\ \hline 9 & -18 \\ \hline -6 & 9 & 15 \\ \hline \end{array}$$
 (The quotient is also a rational number.)

But $\begin{array}{c} -6 & 15 \\ \hline 9 & 18 \\ \hline 15 & 5 \\ \hline \end{array}$ (The quotient is also a rational number.)

The answer is not defined, so rational numbers are not closed under division.

(A) For any rational number
$$\frac{a}{b}$$
, we have (B) For every non-zero rational number $\frac{a}{b}$, We have

$$\frac{a}{b} \div 1 = \frac{a}{b}$$
 and $\frac{a}{b} \div (-1) = \frac{-a}{b}$

$$\frac{a}{b} \div 1 = \frac{a}{b} \text{ and } \frac{a}{b} \div (-1) = \frac{-a}{b}$$
(i)
$$\frac{a}{b} \div \frac{a}{b} = \frac{a}{b} \times \frac{b}{a} = 1$$
 (ii)
$$\frac{a}{b} \div \left(\frac{-a}{b}\right) = \frac{a}{b} \times \frac{b}{-a} = -1$$

Remark: The division of rational number is neither commutative nor associative.

REPRESENTATION OF RATIONAL NUMBERS ON THE NUMBER LINE

We have learnt how to represent integers on the number line.

Draw any line. Take a point O on it. Call it 0 (zero). Set of equal distances on the right as well as on the left of O. Such a distance is known as a unit length. Clearly, the points A, B, C, D represent the integers 1, 2, 3, 4 respectively and the point A', B', C' D' represent the integers -1, -2, -3, -4 respectively

Thus, we may represent any integer by a point on the number line. Clearly, every positive integer lies to the right of O and every negative integer lies to the left of O.

Similarly we can represent rational numbers.

Ex. Represent
$$\frac{1}{2}$$
 and $-\frac{1}{2}$ on the number line.

Sol. Draw a line. Take a point O on it. Let it represent 0. Set off unit length OA and OA' to the right as well as to the left of O.

The, A represents the integer 1 and A' represents the integer –1.

Now, divide OA into two equal parts. Let OP be the first part out of these two parts.

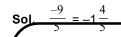
Then, the point P represents the rational number $\frac{1}{2}$.

Again, divide OA' into two equal parts. Let OP' be the first part out of these 2 parts. Then the point P' represents the rational number $-\frac{1}{2}$

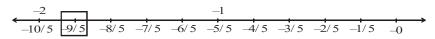
Represent $\frac{4}{7}$ on number line. Ex.

Divide the line segment between 0 and 1 into 7 equal parts (because $\frac{4}{7}$ lies between 0 and 1)

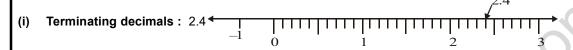
Ex. Represent $\frac{-9}{5}$ on number line.



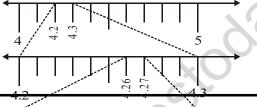
Divide the line segment between -1 and -2 (because $-1\frac{4}{5}$ lies between -1 and -2) into 5 equal parts

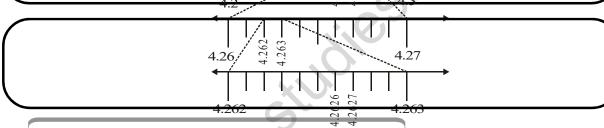


COMPETITION WINDOW



Non terminating & repeating decimals: Visualize $4.\overline{26}$ on the number line, up to 4 decimals places. $4.\overline{26} = 4.262626...$





DO YOUR SELF

Represent each of the following numbers on the number line:

(i)
$$\frac{-1}{3}$$

(ii)
$$\frac{-3}{4}$$

(iii)
$$-1\frac{2}{3}$$
 (iv) $\frac{17}{6}$ (v) -3

(iv)
$$\frac{17}{6}$$

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

FINDING RATIONAL NUMBER BETWEEN TWO NUMBERS

- **1**st **method**: Find a rational number between x and y then, $\frac{x+y}{2}$ is a rational number lying between x and y. (A)
- 2nd method: Find n rational number between x and y (when x and y is non fraction number) then we use formula.

$$\frac{x(n+1)}{n+1}, \frac{y(n+1)}{n+1}$$

(C) 3rd method: Find n rational number between x and y (when x and y is fraction Number) then we use formula

$$\mathbf{d} = \frac{(\mathbf{y} - \mathbf{x})}{\mathbf{n} + \mathbf{1}}$$

then n rational number lying between x and y are (x + d), (x + 2d), (x + 3d)(x + nd)

ilesioon.

Remark: x = First Rational Number, y = Second Rational Number, n = No. of Rational Number

Ex. Find one rational number between $\frac{1}{3}$ and $\frac{1}{2}$

Sol.
$$x = \frac{1}{3}$$
; $y = \frac{1}{2}$ $\Rightarrow \frac{x+y}{2} = \frac{\frac{1}{3} + \frac{1}{2}}{2} = \frac{2+3}{6 \times 2} = \frac{5}{12}$

Ex Find 4 rational numbers between 4 and 5.

Sol. x = 4, y = 5, n = 4

$$\frac{\mathbf{x} \times (\mathbf{n} + \mathbf{1})}{\mathbf{n} + \mathbf{1}} = \frac{4 \times (4 + 1)}{4 + 1} = \frac{4 \times 5}{5} = \frac{20}{5}$$

$$\frac{\mathbf{y} \times (\mathbf{n} + 1)}{\mathbf{n} + 1} = \frac{5 \times (4 + 1)}{4 + 1} = \frac{5 \times 5}{5} = \frac{25}{5}$$

$$\frac{20}{5}$$
, $\left[\frac{21}{5}, \frac{22}{5}, \frac{23}{5}, \frac{24}{5}\right]$, $\frac{25}{5}$

Ex Find 3 rational number between $\frac{6}{5}, \frac{7}{5}$

Sol.
$$\mathbf{x} = \frac{6}{5}$$
, $\mathbf{y} = \frac{7}{5}$, $\mathbf{n} = 3$

$$\mathbf{d} = \left(\frac{y - x}{n + 1}\right) = \frac{\frac{7}{5} - \frac{6}{5}}{3 + 1} = \left(\frac{\frac{7 - 6}{5}}{\frac{4}{3}}\right) = \left(\frac{1}{20}\right)$$

$$\mathbf{x} + \mathbf{d} = \frac{6}{5} + \frac{1}{20} = \frac{24+1}{20} = \frac{25}{20}$$

$$\mathbf{x} + 2\mathbf{d} = \frac{6}{5} + 2 \times \frac{1}{20} = \frac{24 + 2}{20} = \frac{26}{20}$$

$$\mathbf{x} + 3\mathbf{d} = \frac{6}{5} + \frac{3}{20} = \frac{24+3}{20} = \frac{27}{20}$$

$$\frac{24}{20}$$
, $\left[\frac{25}{20}, \frac{26}{20}, \frac{27}{20}\right], \frac{28}{20}$

DO YOUR SELF

(i) Find a rational number between -2 and 6



- (ii) Find 29 rational numbers between $\frac{-2}{5}$ and $\frac{1}{5}$
- (iii) Insert 5 rational numbers between $-\frac{1}{3}$ and $\frac{1}{2}$
- (iv) Find two rational numbers between 3 and 2.

ಅಔಒಕ್ಕಾಖಿಖ್ಖಿಖ್ಔಓ ಘಾಯ್ಓಆಔಘ

ಂಃಖ್ವಾಗವಾಖಿಇ ಗಿಂದಗಣ ಔಈ ಂಓ ಖಓಖಿಇಉಇಖ ಔಖ ಒಔಆಗವಿಗು

ನ್ನುಜಚಳಾಯಿಗಾಣಜತಚಲಿಗಾಜರಾಜಿ ಚಿಟಿ ಹಿಂದಾಜಾವಾದ pan ಲಿಗಾಯಾವಾಫ್ಚಿಟ ಮಾಡಿಭಾರಾಘ್ಯಾರಾಜರಾಜಿ an and (ದಾಹಿ ಟಿಚರಾಗಾಡಿಜಾ). ನ್ನುಜಚಳಾಯಿಗಾಣಜತಚಲಿಗಾಜರಾಜಿ ಚಿಟಿ ಹಿಂದಾಜಾವಾದ ಇ.p. ತಿಡುವಾರಣಜ್ಟಿ ಚಿ. | ಇ ಚಿಟಿಜ p ಜಜಾಚಿಮಿಜಾಜ ಚಿ

$$|\varphi| = \begin{cases} x & \text{if } x \ge 0 \\ -x & \text{if } x < 0 \end{cases}$$

තු. ට. $1 \square 71 = 7$, 131 = 3, සහදේ).

ಂಟ್ರಾ, ಒಚಿಂಧ {ಧಾ □ ಧಾ} = ۱ಥಾ

ಚಟಿಜ □ ಒುಟಿ {p, □ p} = lpj

ಚಟಿಜ $\sqrt{(x)^2} = |\varphi|$

ಚಾಡಿಕಇಖಖಿಖ್ ಇಖ್ ಚಿಕ್ಕ ಂ ಒಡಿಆಗಾಗಿಯ

- (ડ) ાઝા = ા 🗆 ઝા
- (သာ) ၊ಚိಛା = ၊ಚိ၊ ၊ಛ
- (w) $\left| \frac{\mathbf{a}}{\mathbf{b}} \right| = \left| \frac{\mathbf{a}}{\mathbf{b}} \right|$
- **(ઢ)** ાઝ+¢ા ≤ ાઝા + ા¢ા

- (මා) හෝසි යෝ \leq ආ \Rightarrow \square ආ \leq ಚಿ \leq ආ
- (w) $\,$ మాజీ బి $\,\square\,$ భక $\,\cong\, \supset \square\,$ భా $\,\leq\,$ జి $\,\square\,$ భక $\,\cong\, \supset \diamondsuit\,$ ధ $\,\square\,$ భా $\,\leq\,$ జి $\,\leq\,$ ధ+ భ

DO YOUR SELF



උතුනු වේ පාර්ත වේ පාර්ත වේ වේ වේ □ වේ වේ වේ □

(a)
$$\varphi = \frac{-9}{7}$$
, $\varphi = \frac{3}{4}$ (b) $\varphi = \frac{8}{-3}$, $\varphi = \frac{-7}{9}$

ე පැනුදෙල් පර්සූය ලේ මේ = ලේ මේ ලේ සුලෙල □

(a)
$$\varphi = \frac{3}{4}$$
, $\varphi = \frac{-1}{2}$ (a) $\varphi = \frac{-7}{8}$, $\varphi = \frac{1}{-4}$

නීතෘතුන සිසා නාංනීන්සිද්ාන ද්උද:තුනන

- (ಚ) නිසැමණ්ඩ්සාන්ට සසැරණ්ඩ්ඩ ඩම්කුකම
- (ආ) ಓල්ඩ-ශක්ෂික්ස්සන්ව ශික්කස්කණ්ට (ශික්කිකිශික්ව) සත්කික්ස් සික්කුක්ල.
- (ಚಿ) **එසි නියේචෝ සෙත්රාන්ඩ :** නිදස මිවිමෙසිස **'ශකි නිනේච්චිශස**් නොනෙසිද් **"ක්ථස**" යි සක්රානාවිඩ බදයිල ක්රිසද උයි ලකිනින්ට්ට සක්රානවිඩ මිසදයිමා යි සිතුම් සීමයිඳීලාවේ. කොතුම සිතුම් සිතුම් සිතුම් සිට සිතුම් සිතුම් සිතුම් සිතුම් සිතුම් සිතුම් සිතුම් බදාස සත්රානවිඩ මිට්ටේලා නො බදෙකුම් සීම සලක්මින්ට්ටේ ලක්ණින්ඩායිඩ.
- **29** $\frac{3}{4} = 0.75, \frac{8}{10} = 0.8, \frac{1}{4} = 0.25$
- **Seq.** $\frac{8}{3} = 2.666.... = 2.\overline{6}$

මයිට්, උතුනානායිට් සිස් ට්යිට් නිතුනයන්ට්රන්න්ට්ණ & නතුකුරන්න්ට්ණ පතුපන්ට්රන්න වැඩැතුනන නිසි නිණතු සෑයිනට

්.මෝ-ලක්ඛන්ථෙන්න්ට ඔකුන්නන්ට සකුන්න්ඩ්, ප්ඔස පුනුන්ජඩ්ඩ්ඩ ලම්ම ලෙමුවසු

- (၁) **ಹಾಡಿಜ ಡಿಜಾ)ಗಾಡಿಡುವಿಂದ ಜಜಾಖಿಯಾವಿಟ್ :**🗋 ೦ ಜಜಾ**ಖಿಯಾವಿಟ** ಮಿತ್ರಿಮಿಸಿ ಚಿಟ್ಟಿಟ್ ರಾವಿಜ ಡಿಜಾಯಾ ಚಿಜಿರಾವಾ ರಾವಿಜ ಜಾಖಿಯಾವಿಟ್ ರಿಯಾಪ್ ಚಿಡಿಜ ಡಿಜಾಯಾವರಣವಾಜ. ರಾವಿಜ್ ಣಧಾರಿಇ ರಾಜಿ ಜಜಾಭಿಮಾಚಿಟ್ಟ ಚಿಡಿಜ ಞಟ್ರಾಂಟಿಟ್ ಚಿ ರಹಾಡಿಜ ಡಿಜಾಭಿಹಾಡಿಡುಕುರ ಜಜಾಭಿಮಾಚಿಟ್ಟ.
- 0.6, 0.16, 0.123 ಚಿಡಿಜ ರಿಹಾಡಿಜ ಡಿಜಾರಿಕಾಡಿಡಿಯೆಂ ಜಜಾರಿಯಚಿಟ್ಟ குடி
- **ොගුසාස ලිපාටිබලිංග්ට සංසැර්න්නේ:ට** 0 සපාරුණාන්හි ණ් මුදාරු නිසල භිපාදිත ජේස ලාදී සදාගත ප්ස්තවා වෙන්න නැති සමාරුණන් (x) මහානස්ගනාස ස්වීත ලාදන්. ලෝක නාගල මේ නාගල ස්මත මහානස්ගනාස. නිදෙන ගෙරීමක නම නනැතින්වේ ස්මත ආච්මේව් ස් විශාන මනැතිමමණ්ට සසආයාසේ ඩු.
- $2.1\overline{6}, 0.3\overline{5}, 0.7\overline{85}$ eldes tapes despendento supplied.

ಆಭಖಇಅಖಿ ಒಇಖೀಡಿಆ

 $\left(\frac{p}{q}\right) form = \frac{(Complete \ numbers) - (number \ formed \ by \ Non - repeating \ digit)}{No. \ of 9 \ as \ no. \ of \ repeating \ digits \ after \ that \ write \ no. \ of 0 \ as \ no. \ of \ non \ repeating \ digits.}$

SATI (3)
$$0.\overline{35} = \frac{35-0}{99} = \frac{35}{99}$$

(a)
$$0.4\overline{35} = \frac{435-4}{990} = \frac{431}{990}$$

(a)
$$0.\overline{35} = \frac{35 - 0}{99} = \frac{35}{99}$$
 (a) $0.4\overline{35} = \frac{435 - 4}{990} = \frac{431}{990}$ (a) $23.\overline{43} = \frac{2343 - 23}{99} = \frac{2320}{99}$

තු
$$\frac{p}{q}$$
 මෙන්මන්ම ෙනෙදස $23.\overline{43}$ විශේකයාම වේ නොදස සීම්මර් $\frac{p}{q}$

$$\Rightarrow$$
 $\varphi = 23.434343...$

ಊಷಾಜ ತಿಜ್ಚಚಿತಾ ಹಟಿಟಿಥ ಣತಿರ ಡಿವಾಚುಚಾಟಿರ ಜಾರಾ ಚಿಜೀಣವಾ ಜಜ್ಚುಕುಚಿಟ್ ರ ತಿಜ ಕೇಂಟಾರಿಟಿಥ ಛಾರಾ ಸಾಜ್ ಛಾರ್ 100.

$$100 \quad \varphi = 2343.4343...$$
 ...

ಖಾಂಭಾರಾಡಚಿಳಿದುವಿರ(ು) ಜಿಡರಾವ(ು), ತಿಜರಾವಣ

$$100 \oplus \Box \oplus = (2343.4343...) \Box (23.4343...)$$

$$\Rightarrow \quad \varphi = \frac{2320}{99}$$

ാലായുള്ള വുട്ടുവി

$$\Rightarrow 23.\overline{43} = 23 + \frac{43}{99}$$

ုက်ပီးဝေ ကလေ့ဆ ಚಿಳುအားအော မောက်ပေးဆွဲ ခွေဆာပ္ခရာအား $0.\overline{43}=\frac{43}{99}$

$$\Rightarrow 23.\overline{43} = \frac{23 \times 99 + 43}{99}$$

$$=\frac{2277+43}{99} = \frac{2320}{99}$$

පදා ක්සී
$$\frac{1}{7} = 0.\overline{142857}$$
, ම්වියාසෙ සොදස සහජානාස්ව සතුම වනුනාස්ව සහ $\frac{2}{7}, \frac{3}{7}, \frac{4}{7}, \text{ and } \frac{5}{7}$ මාතාදයන ස්ථානාස්වර්ග සහජාව සාස්වර්ග

ಜುತ್ತು ಸಾಟಿ.

കൊല്. ಖീറൂതു, ತಿಜ ೧ಚಿತಜ

$$\frac{2}{7} = 2 \cdot \frac{1}{7} = 0.\overline{285714}$$
; $\frac{3}{7} = 3 \cdot \frac{1}{7} = 0.\overline{428571}$

$$\frac{4}{7} = 4_{\circ} \frac{1}{7} = 0.\overline{571428}$$
; $\frac{5}{7} = 5_{\circ} \frac{1}{7} = 0.\overline{714285}$

ಖ್ಖಖಂಖಿಖ್ಔಓಂಐ ಓಗ್ರಾಣ್ಯಖ

o ಟ್ಹಾಭಾಮ) ಭಚಟಟಜಾಜ ಮಾಡಚಣಾಖೆಚಟ ಟ್ಹಾಭಾಮ ಜಿ or ಭಚಟಿ ಟಿಂದಾ ಳಾಜತಿಡುಗಾಣಾಜಿ ಪಿ ರಾಜಜಿಯಾದ $rac{p}{q}$, ತೃಜಾಜರ ಚಿಟಿಜ ಧಚಿಡಜಪಿಣಜಾಮಾaಚಿಟಿಜ ಧa
eq 0.

න න

o ಟಿರ್ಟಿ-ಣವಾದಿಯುಚಿಣಯಿಂ ಚಿಟಿಜ ಓರಟ-ಡಿವಾವಚೀಯಲಿಂ ಜವಾಭಿಯಾಚಿ p ಭಿಚಿಟಟವಾದ ರು ಹಾಡಿಚೀರಾಹುಚಿಟ ಟಿಕ್ಕಾಮಾಡಿ

ඉඛ 0.10100100010000...කාඛ., $\sqrt{2}, \sqrt{3}, \sqrt{5}$...etc., $3\sqrt{2}, 3\sqrt{3}, 3\sqrt{4}$...etc. ප්ෂිස π

லண்ணிகு : (3) π , ಚರಾಧಿದ ಭಾಷಣ ಚಲು ಭಾಷಣ ಚಲು ಸಂಖ್ಯೆ ಸ್ಥಾಪಿ ಬಿ. ಸ್ಥಾಪಿ ಬೆ. ಸ್ಥಿಪಿ ಬೆ. ಸ್ಥಾಪಿ ಬೆ. ಸ್ಥಾಪಿ ಬೆ. ಸ್ಥಿಪಿ ಬೆ. ಸ್ಟಿಪಿ ಬೆ

නාංනික්සිද්රතක්සානික්සිද් සිස් නැතපන සින නාංපක්ෂාතන

- (3) ಖಚನಾಹುಚಟುಮುಖಂ ಜಚಳಿಗಾರಾ ರಾಜಿ \sqrt{a} , \sqrt{a} $\left(Q\sqrt{a} imes\sqrt{a}=a\right)$
- (හ) නෙස්බන්සේස්ඩාත්වෙල සිස්ළුබල්ම ලාසි $\sqrt[3]{a}$ දා $\sqrt[3]{a^2}$ $\left(Q\sqrt[3]{a} imes \sqrt[3]{a^2} = \sqrt[3]{a^3} = a\right)$
- (w)) නැස් ලැබෙන්නේ ස්ථාවක්ට සිස් එල ලෙක ලකි. $\sqrt{a} + \sqrt{b}$, $\sqrt{a} \, \Box \, \sqrt{b}$. & නොදින නොකිලෙන් $\left[Q \left(\sqrt{a} + \sqrt{b} \right) \! \left(\sqrt{a} \sqrt{b} \right) = a b \right]$
- (නම) නෙස්වාන්ස්වාන්ස්ට සැස්ළැබලක්ව ලාස සේ + \sqrt{b} , p ස් $\Box \sqrt{b}$. ඔ නොසැස නොක්දෙස් $\left[Q\left(a+\sqrt{b}\right)\!\left(a-\sqrt{b}\right)\!=a^2-b\right]$
- (3) නාස්තෘත්වස්ථාක්ව සිස්තිතම සහ $\sqrt[3]{a} + \sqrt[3]{b}$ p $\left(\sqrt[3]{a^2} \sqrt[3]{ab} + \sqrt[3]{b^2}\right)$ $\left[Q\left(\sqrt[3]{a} + \sqrt[3]{b}\right)\left(\sqrt[3]{a^2} \sqrt[3]{ab} + \sqrt[3]{b^2}\right)\right]$ $\left[Q\left(\sqrt[3]{a}\right)^3 + \left(\sqrt[3]{b}\right)^3\right] = a + b$. Supply p designabilities.
- (**ab)** නාස්තෘස්ථස්ඩාක්ථාල සිස්ජිලාලකි ලාසි \sqrt{a} + \sqrt{b} + \sqrt{c} $\wp\left(\sqrt{a} + \sqrt{b} \sqrt{c}\right)$ සිඩ්ස (සි + $\wp\Box$ ළු \Box $2\sqrt{ab}$).

- (3) $\sqrt{10}$
- (a) $\sqrt{162}$
- (an) $\sqrt[3]{4}$
- (38) $\sqrt[3]{16}$

නාසේ. (3) $\sqrt{10}$

[
$$\rightarrow$$
 $\sqrt{10}$ $_{\circ}$ $\sqrt{10}$ = $\sqrt{10 \times 10}$ = 10] 24 10 ho @2300x8812888 &35x82x828

(a) $\sqrt{162}$

නාන්ටෙඩෙකු සීමාබඩ 9 $\sqrt{2}$

ಖಚಿಣಾಹುಬಿಚಟುವಾಮಿರಜಿಚಛಿಣವಾಡಿ ಇಜಿ $\sqrt{2}$ ಸ $\sqrt{2}$

ಖಚಿಣುಹುಚಿಟುವುಬರಜೀಚಿಳಿದಾರಾ ರಾಜಿ $\sqrt{1\,6\,2}$, $\sqrt{2}$

(a) $\sqrt[3]{4}$

$$\Rightarrow \sqrt[3]{4} = \sqrt[3]{4^2} = \sqrt[3]{4^3} = 4$$

ಖಚಣಾಹುಚಟುವಾಟರಜೀಚಿಲಾಂಡಾ ರಾಜಿ $\sqrt[3]{4}$ ಸ $\sqrt[3]{4^2}$

(38) $\sqrt[3]{16}$

නාන්ඩෙඩසාංශ ස්වෘතිසා වාස් $\sqrt[3]{16}$ ා 2 $\sqrt[3]{2}$

ಓತಾತಿ ಡಚಣಾಹುಚಿಚಟುವಾಟರ ಜೀಚಳಿಗಾರಾ ರಾಜಿ $\sqrt[3]{2}$ ಸ $\sqrt[3]{2^2}$

 \therefore ಖಚಿಣാജ്ಚെಟ്ಟಾಮ್ರಜೀಚಿಲ್ಲಾಣಾಡಾ ರಾಜಿ $\sqrt[3]{16}$ ു $\sqrt[3]{2^2}$

യുനു. $ext{ + will se }$ മെഷ്ണായിഷിലാമായ് ഉഷ്ണി തരു $ext{ }^4\sqrt{162}$

නොන්. නෝනවිදාග සංඛව ලස $\sqrt[4]{162}$ ා $3\sqrt[4]{2}$ ි. ලසි ශිස්හාණ්ස්ව්යාණ්ට සිස්එශලේම ලාසි $\sqrt[4]{2}$ ා $\sqrt[4]{2^3}$ ∴ නස්හාණ්ස්ව්යාණ්ට සිස්එශල්ම ලාසි $\sqrt[4]{162}$ ා $\sqrt[4]{2^3}$

- (ಚಿ) ಏಜಾ ಧರಾಜಚಿ ತಚಿಣವಾಟಿಚಿಟ ಟ್ಹಾಮಾಡಾ ತಿಸ್ತಜಜನಾಯ್ಚಿಟ ಜಾಘಚಿಟಿಸುವ ಣಜಾಹುಮಚಿಚಣಇ ಖಿ.ಜಾಟಿ ತಜಳಿಚಿಟಿ ಜಾಘಾತಭಾಜ ಧರು ಣಾಸಜಜಿಯಾದ $rac{p}{q}$, ತಿಸಬಾಹಜತಿ ಚಿಟಿಜ ತಚಿತಜಳಿಂ-ತಡಿಯಾ, ಚಿಟಿಜ ಣಾಸಜತಿಡಿಯಾಜಜಿಚಿಳಿಣಯಾಸುಚಾರಾಟಿ ರಾಜಿ ತಂಗ ತಜಿ ತಾಗಜಜಿಯಾದಲ್ಲಿ 5^{tt} , ತಿಸಬಾಹಜವುಟಿ ಚಿತಜ ಟಿರಾಟಿ-ಟಿಜಾಚಿತಾಜ ಹಿಚಿಕಬಡುತ್ತು.
- (4) වස $\phi = \frac{p}{q}$ දැස ප් පිප්තාණ්ස්ස් සිත්තුනේ, තුංදා තැස්ත තාප පිපින්න සිස්එකත්වෙන්න සේ පවස්වත සේ තෙදස සිහිසෙ 2^{t_0} 5^{t_0} , මුදක්සෙ සිස් ප්ටස සිතිය සිත් පිට් සිත්තුන්වෙන් සිත්ව සිත්වස් සිත්වස් මාදාද වස් සිත්වස් සිත්වස

eq. (a)
$$\frac{189}{125} = \frac{189}{5^3} = \frac{189}{2^0 \times 5^3}$$

ം അഷ്ക്ക $\frac{189}{125}$ പൂർ നമ്മിക്ക്ക്ക്ക് കൂക്ക്ക്ക് മുമിക്ക്ക്

(a)
$$\frac{17}{6} = 2.83333....$$

(ತಿಜರಾಣಾನತಾಜರಾಭಚರ ರಾಜಕರಾಮುಜಜಿಚಿಳಿದ್ದಾತು. ರಾಜಕರಾಮಿ ನಿರ್ಣಿಕ್ಕಾರ ಕಾರ್ಯಕರ್ಷ ನಿರ್ಣಕ್ಕಾರ ನಿರ್ಣಿಕ್ಕಾರಿ ಬಿಡುವ ಕಾರ್ಯಕರ್ಮ ನಿರ್ಣಕ್ಕಾರ ನಿರ್ಣಕ್ಕಾರ ನಿರ್ಣಿಕ್ಕಾರ ನಿರ್ಣಕ್ಕಾರ ನಿರದ ನಿರ್ಣಕ್ಕಾರ ನಿರದ ನಿರದ ನಿರದ ನಿರದ ನಿರದ ನಿರ್ಣಕ್ಕಾರ ನಿರ್ಣಕ್ಕಾರ

സേഷിർ $pprox rac{17}{6}$ വുഷ് ല്യ്-നെഷ്ക്ഷ്ഷേസ്മാ മയാഷാനാല് വയയുടെ വരുന്നു.

(ax)
$$\frac{17}{8} = \frac{17}{2^3 \times 5^0}$$

(കാര, നാരുടെ ടുടുങ്ങ്ങ്ങ്ങൾ 8 മൂൻ $\frac{17}{8}$ ho മൂൻ നാരുടെ ടൂർമിലെ 2^b $_o$ 5^b , ತಿನುಮಾರಿಕ ಅವರು ಚಿರಾಜ ಅವರು ತಿರುತ್ತಿ വരുടെ വരുടെ

ം സൈഷ്റ്റോജ $rac{17}{8}$ പൂപ്പു നെഷ്കിയില്പ്പോല്റെ ജഷൂറിയില്ല് ഷുക്ഷില് വുക്

(38)
$$\frac{64}{455} = \frac{64}{5 \times 7 \times 13}$$

(ಅಟ್ಟುಚಿಡಿಟ್, 455 ho ಟಿರಾ ರಾಜಿ ಸಂಸ್ಥಜಜಿಯಿ 2^6 $_0$ 5^6 . அது ಸಂಸ್ಥಜಜಿಯ ಸಥಾಪಿಕಿಕೊಂಡು $\frac{64}{455}$ ho ಟಿರಾ ರಾಜಿ ಸಂಸ್ಥಜಜಿಯ ಸಥಾಪಿಕಿಕೊಂಡು $\frac{64}{455}$ ho ಟಿರಾ ರಾಜಿ ಸಂಸ್ಥಜಜಿಯ ಸಂಸ್ಥಜಜಿಯ ಸಥಾಪಿಕೊಂಡು $\frac{64}{455}$ ho ಟಿರಾ ರಾಜಿ ಸಂಸ್ಥಜಜಿಯ ಸಥಾಪಿಕೊಂಡು $\frac{64}{455}$ ho ಟಿರಾ ಸಹಾಪಿಕೊಂಡು $\frac{64}{455}$ ho ಟಿರಾ $\frac{64}{455}$ ho ಟಿರಾ ಸಹಾಪಿಕಿ $\frac{64}{455}$ $\frac{64}{45$

SOLVED EXAMPLES

ಈාಖ්ಜ දා යෑ තෙදස ස්වේඩවමාන්ට මන්ටේ ලස් බන්තාවේන්ඩ ඩිම්කුක්ට න්ටිය සැම්ඩේ :

(i)
$$\frac{x}{4}$$
, $\frac{16}{12}$

(a)
$$\frac{-4}{5}$$
, $\frac{x}{10}$

(a)
$$\frac{x}{4} = \frac{16}{12}$$

 $\Rightarrow \varphi_{\circ} 12 = 4_{\circ} 16$

(දාඛ ද්) බව විධි වස සඳවා ම සෑවන්

(ರಾಜಚಟಿ)

$$\Rightarrow \varphi = \frac{4 \times 16}{12} = \frac{16}{3}$$

(a)
$$\frac{-4}{5} = \frac{x}{10}$$

$$\Rightarrow$$
 5 $_{\circ}$ $\varphi = (\Box 4)_{\circ}$ 10

$$\Rightarrow$$
 5 $_{\circ}$ $\varphi = (\Box 4)_{\circ}$ 10 $\Rightarrow \varphi = \frac{-4 \times 10}{5} = \Box 8$

ఇ ధా. 2 ంజజ
$$\frac{7}{9}$$
 జిట్జ $\frac{-12}{9}$

නත්ඩ්.

$$\frac{7}{9} + \frac{-12}{9} = \frac{7 + (-12)}{9} = \frac{-5}{9}$$

$$7 + (\square 12) = \square 5$$

තුනුරා, ලාස නොදාස විශේතනාකි. $\frac{3}{-4}$ ස්වේස $\frac{-5}{6}$ ho ට්කිසෝ ශාස්ක? ජාතිශ මස මිඛාශස සාස්චා ලාස ශාස බාසෝ විශ්කානාකි. මාතා විඛාශාස සස්වේත්වේස්ගලාම

මිඵිස ඵැත්තුතෙම =
$$\frac{3}{-4} = \frac{3 \times (-1)}{(-4) \times (-1)} = \frac{3}{-4}$$
.

නිදස වැතුසුම සිත්කුසුම =
$$\frac{-5}{6}$$
.

$$\therefore \quad \frac{3}{-4} = \frac{(-3) \times 3}{4 \times 3} = \frac{-9}{12} \quad \text{also} \quad \frac{-5}{6} = \frac{(-5) \times 2}{6 \times 2} = \frac{-10}{12}$$

అటబుంచింది,
$$\frac{-9}{12} > \frac{-10}{12}$$
 . ఆయుప్రభిష $\frac{3}{-4} > \frac{-5}{6}$

$$\frac{8}{-15} + \frac{4}{-3} = \frac{-8}{15} + \frac{-4}{3}$$

89 (D. 4 satisfied 9:
$$\frac{-8}{-15} + \frac{4}{-3}$$
 8006. Fixe 9.23 feet,
$$\frac{8}{-15} + \frac{4}{-3} = \frac{-8}{15} + \frac{-4}{3}$$

$$\left[Q \frac{8}{-15} = \frac{8 \times -1}{(-15) \times (-1)} = \frac{-8}{15} \text{ and } \frac{4}{-3} = \frac{4 \times -1}{(-3) \times (-1)} = \frac{-4}{3} \right]$$

ಖಜ-ತಿಡುಗಾಖಿo $\frac{-4}{3}$ ಮಿ ಣುಜಜೀಡಾಹಿಯ ತಿನುಭು ಗಾ ನಚಿ ಜಜಾಪಡೆಯುಬಿಚಣವಾಡಿ 15, ತಿಜರಾಣ

$$\frac{-4}{3} = \frac{-4 \times 5}{3 \times 5} = \frac{-20}{15}$$

$$\frac{-8}{15} + \frac{4}{-3} = \frac{-8}{15} + \frac{-4}{3}$$
$$= \frac{-8}{15} + \frac{-20}{15}$$

$$= \frac{(-8)+(-20)}{15} = \frac{-28}{15}$$

$$\left[Q \frac{-4}{3} = \frac{-20}{15} \right]$$

$$\mathbf{e}_{1}\mathbf{p}_{2}\mathbf{p}_{3}\mathbf{p}_{4}\mathbf{p}_{5} = \left(\frac{a}{b} + \frac{c}{d}\right) + \frac{e}{f} = \frac{a}{b} + \left(\frac{c}{d} + \frac{e}{f}\right) \text{ with } \frac{a}{b} = \frac{-2}{3}, \frac{c}{d} = \frac{5}{7} \text{ with } \frac{e}{f} = \frac{-1}{6}$$

ಖಾಟ.

$$\left(\frac{a}{b} + \frac{c}{d}\right) + \frac{e}{f} = \left(\frac{-2}{3} + \frac{5}{7}\right) + \frac{-1}{6} \quad \Rightarrow \quad \frac{(-2) \times 7 + 3 \times 5}{21} + \frac{-1}{6} = \frac{(-14) + 15}{21} + \frac{-1}{6}$$

$$\Rightarrow \frac{1}{21} + \frac{(-1)}{6} = \frac{1 \times 2 + (-1) \times 7}{42} = \frac{2 + (-7)}{42} = \frac{(-5)}{42} = \frac{-5}{42}$$

జిట్జ,
$$\frac{a}{b} + \left(\frac{c}{d} + \frac{e}{f}\right) = \frac{-2}{3} + \left(\frac{5}{7} + \frac{-1}{6}\right) \implies \frac{-2}{3} + \frac{5 \times 6 + 7 \times (-1)}{42} = \frac{-2}{3} + \frac{30 + (-7)}{42}$$

$$\Rightarrow \frac{(-2)}{3} + \frac{23}{42} = \frac{(-2) \times 14 + 23 \times 1}{42} = \frac{(-28) + (23)}{42} = \frac{(-5)}{42} = \frac{-5}{42}$$

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

ಖಾಂಖೆ. ಖುಜ ಚಿಜಜಾಗಾಹಾ ಚಿತ್ರಾಣಿಜ ರಾಜಿ
$$\frac{-3}{8}$$
 ್ಗ $\frac{3}{8}$

$$\left[Q - \left(\frac{-3}{8}\right) = \frac{3}{8}\right]$$

$$\therefore \quad \frac{-5}{7} \quad \Box \left(\frac{-3}{8}\right) = \frac{-5}{7} + \frac{3}{8} = \frac{(-5) \times 8 + 3 \times 7}{56} = \frac{-40 + 21}{56} = \Box \frac{19}{56}$$

न्द्रक.
$$7$$
 क्युंधेल धीत्रर्थक्रिके ,्युंक्स्थेस क्या सेस्ट्रस्थ लाग्न $\frac{-5}{8}$, σ से लाग्न क्या $\frac{5}{9}$?

കാരി. ചുറുളെ സു സുയു വിഷ്ണായിഷ്ಟ പ്രസ്തായി നേനെ വുടു ഷ്യയയായ നേന്ന
$$\frac{-5}{8}$$
 നേനെ വാണ $\frac{5}{9}$. മ്യോയി,

$$\frac{-5}{8} + \varphi = \frac{5}{9} \qquad \Rightarrow \qquad \varphi = \frac{5}{9} \square \left(\frac{-5}{8} \right) \qquad \qquad \left[\text{Transposing } \frac{-5}{8} \text{ to RHS} \right]$$

Transposing
$$\frac{-5}{8}$$
 to RHS

$$\Rightarrow \varphi = \frac{5}{9} + \frac{5}{8} \qquad \Rightarrow \qquad \varphi = \frac{5 \times 8 + 5 \times 9}{72} = \frac{40 + 45}{72} = \frac{85}{72}$$

ಇ.ಧ. 8 ಕ್ಕಾಚಿಣ ,ಸ್ಥತಾಟಕ ಭಾರ್ಷ, ಸಾಧಾಂಡಿಚಿಳಿಣಕ್ಕು ಜಿಡಿತಂ
$$\frac{-3}{4}$$
 , $\mathfrak o$ ಚಿ. ೧೦ ರಜಣ $\frac{5}{6}$?

ಖാലി. ചുറുളേള നൂ. തുടു മെല്താലില്ല് ല്റുമുമ് തര വാം. സൂനാരില്ന്റോടാട ജീമത്
$$\frac{-3}{4}$$
 തര വാന $\frac{5}{6}$. മിവുഷ്.

$$\frac{-3}{4} \square \varphi = \frac{5}{6} \implies \frac{-3}{4} \square \frac{5}{6} = \varphi$$

$$\frac{-3}{4} \square \varphi = \frac{5}{6} \implies \frac{-3}{4} \square \frac{5}{6} = \varphi$$
Transposing x to RHS and $\frac{5}{6}$ to LHS

$$\Rightarrow \varphi = \frac{-3}{4} \square \frac{5}{6} \qquad \Rightarrow \varphi = \frac{-3}{4} + \frac{-5}{6} \qquad \left[Q - \frac{5}{6} = \frac{-5}{6} \right]$$

$$\Rightarrow \varphi = \frac{-3}{4} + \frac{-3}{6}$$

$$\left[Q - \frac{5}{6} = \frac{-5}{6}\right]$$

$$\Rightarrow \varphi = \frac{(-3) \times 3 + (-5) \times 2}{12}$$

⇒
$$\varphi = \frac{(-9) + (-10)}{12} = \frac{-19}{12}$$
 [→ ≈∞2 22 4 23 22 6 0 12]

$$\begin{array}{lll} \text{SOME}. & \text{SAMES COMS: } \frac{6}{7} \ \Box \ 2 + \frac{-7}{9} \ + \frac{19}{21} \\ \text{SNOWED}. & \text{SAMES SAMES } \frac{6}{7} \ \Box \ 2 + \frac{-7}{9} \ + \frac{19}{21} \\ & = \frac{6}{7} \ + \frac{(-2)}{1} \ + \frac{(-7)}{9} \ + \frac{19}{21} \\ & = \frac{6 \times 9 + (-2) \times 63 + (-7) \times 7 + 19 \times 3}{63} \\ & = \frac{54 + (-126) + (-49) + 57}{63} \ = \frac{111 + (-175)}{63} \ = \frac{-64}{63} \end{array}$$

29. Eq. 1.0 satisfield 38 ap : (a)
$$\frac{-2}{3} + \frac{5}{9} \Box \frac{-7}{6}$$
 (b) $\frac{5}{12} + \frac{-5}{18} \Box \frac{7}{24}$

ಖಾಟ. (ು) ಘಜ ೪ಚಿತಜ,

$$\frac{-2}{3} + \frac{5}{9} \Box \frac{-7}{6} = \frac{-2}{3} + \frac{5}{9} \Box \frac{7}{6}$$

$$= \frac{(-2) \times 6 + 5 \times 2 + 7 \times 3}{18}$$

$$= \frac{-12 + 10 + 21}{18} = \frac{-12 + 31}{18} = \frac{19}{18}$$
[A Decay and 3, 9, which is 4, 15.

(ಎಂ) ಘಟ ುಚಿತಜ್ಯ

$$\frac{5}{12} + \frac{-5}{18} \Box \frac{7}{24} = \frac{5}{12} + \frac{-5}{18} + \frac{-7}{24}$$

$$= \frac{5 \times 6 + (-5) \times 4 + (-7) \times 3}{72}$$

$$= \frac{30 + (-20) + (-21)}{72} = \frac{30 + (-41)}{72} = \frac{-11}{72}$$
[\$\frac{1}{72}\$ \text{ See as } 12, 18 \$\frac{24}{24}\$ \text{ See as } 12, 18 \$\

තු \mathbf{p} . $\mathbf{11}$ $\mathbf{12}\frac{1}{4}$ හි අවසිතතා, අවසා කු. $\mathbf{212}\frac{1}{3}$ සීජේස කාස අවසා සේ $\mathbf{1}$ හි අවසිතතා :

ఖుంటి. అని.
$$212\frac{1}{3} = \frac{637}{3}$$

$$భిథాం రాజి 1 ట భిటియాని = \frac{637}{3} ÷ \frac{49}{4} = \frac{637}{3} ∘ \frac{4}{49} = \frac{52}{3} = ఖ. 17\frac{1}{3}$$

$$\mathbf{SP} \text{ (p. } \mathbf{12} \quad \text{substituting} \quad \left(\frac{-7}{18} \times \frac{15}{-7}\right) \ \square \ \left(1 \times \frac{1}{4}\right) \ + \ \left(\frac{1}{2} \times \frac{1}{4}\right)$$

නු ගු.
$$13$$
 නේකව්ඨාසීඛ : $\frac{-3}{5}$ $_{\circ}$ $\left(-\frac{10}{9}\right)$ $_{\circ}$ $\left(\frac{21}{-4}\right)$ $_{\circ}$ (\Box 6)

ಖಾಟ. ಘಟ್ನಚಿತಜ್ಞ

$$\frac{-3}{5} \circ \left(-\frac{10}{9}\right) \circ \left(\frac{21}{-4}\right) \circ (\Box 6) = \frac{-3}{5} \circ \frac{-10}{9} \circ \frac{21}{-4} \circ \frac{-6}{1}$$

$$\Rightarrow \frac{(-3) \times (-10) \times 21 \times (-6)}{5 \times 9 \times (-4) \times 1} = \frac{-(3 \times 10 \times 21 \times 6)}{-(5 \times 9 \times 4 \times 1)} = \frac{3 \times 10 \times 21 \times 6}{5 \times 9 \times 4}$$

$$\Rightarrow \frac{1 \times 5 \times 21 \times 6}{5 \times 3 \times 2} = \frac{1 \times 1 \times 7 \times 3}{1 \times 1 \times 1} = 21$$

ရာ ထု.
$$14$$
 နာမီးကားအ ကရေးအ မေးဆားသောမြောင်းတော့မေးမိုး တည်း အေးဆီးဆိုရာ တည်း ကရေးအ ဆိုစော်မြေစစ်ဆော်ဝ မိုးမောကားမေးမိုးမိုး မီးကားသောနော်ရေး (၁) $\frac{2}{5}$

හනස්. (3) වාසාද්ධවේ අවස්ව යාස්
$$\frac{2}{5}$$
 ρ $\frac{5}{2}$ ාස, $\left(\frac{2}{5}\right)^{-1} = \frac{5}{2}$ (3) වාසාද්ධවේ අවස්ව යාස් $\frac{-7}{15}$ ρ $\frac{15}{-7}$ ාස, $\left(\frac{-7}{15}\right)^{-1} = \frac{15}{-7}$

29. (3)
$$\frac{3}{5}$$
 44 $\frac{4}{25}$ **(3)** $\frac{-8}{9}$ **44** $\frac{4}{3}$

exacts. (a)
$$\frac{3}{5} \div \frac{4}{25} = \frac{3}{5} \cdot \frac{25}{4} = \frac{3 \times 25}{5 \times 4} = \frac{3 \times 5}{1 \times 4} = \frac{15}{4}$$

(a)
$$\frac{-8}{9} \div \frac{4}{3} = \frac{-8}{9} \cdot \frac{3}{4} = \frac{-8 \times 3}{9 \times 4} = \frac{-2 \times 1}{3 \times 1} = \frac{-2}{3}$$

තු \mathbf{p} . 16 වේදන මයි ලක් සම වේදන් සම්බන්ධ වේදන්වන්ව ව සම්බන්ධ ව $\frac{-28}{81}$. වෙනි සම්බන්ධ සම සම සම සම්බන්ධ ව $\frac{14}{27}$, නිවේන සාදන සාදනයි.

ಖಾಟ. ಘಜ್ನಚಿತಿಯ

$$= \quad \phi_{\circ} \; \frac{14}{27} = \Box \; \frac{28}{81}$$

$$\varphi = \frac{-(28 \times 27)}{81 \times 14} = \frac{-(2 \times 1)}{3 \times 1} = \frac{-2}{3}$$

තු හැ. 17 ෘඛ මාස්ත වෙන්නෙන් ාුකාන්ස මස නිත්වාගාවවට $\frac{3}{-14}$, ා හොස්ත හාස මයිනෙන්වෙන නිස්ඛ දාස $\frac{5}{12}$?*

ಖಂಟ. ಘಟ ನಚಿತಜ

සා තාංකා තාංක ගමා සම්ප්රාන්ති =
$$\frac{5}{12}$$
, ඕස්ස ස්ක්ෂාන්ති = $\frac{3}{-14}$

$$=\frac{3}{-14} \circ \varphi = \frac{5}{12}$$

$$\therefore$$
 গ্রীগৃহ অসম্প্রাট গ্রীকার্মেটে ক = $\frac{-(5 \times 14)}{12 \times 3} = \frac{-(5 \times 7)}{6 \times 3} = \frac{-35}{18}$

ಔಃಎಇಅಖಿಖೆಗಿಇ නී ක පනු ಕಿಗ್ಗಾಖಾಖಿ ಋ ಔ ಓ ಖ

ಅಊಟಿಟಿಖ್ಲಾ ಬಿಲ್ಲೂ ಅಡಿಖಖಇಅಖಿ ಔಓಇ

- മീയും അന് തൽ തായു വരുന്നാണിയില് ലിൽക്കുമ്പ് $\Box \frac{5}{16}$ വില്യ $\frac{7}{12}$ പ
 - (o) $\Box \frac{7}{48}$
- (i) $\frac{1}{24}$
- (ω) $\frac{13}{48}$

- യുഷ്ന പ്രീക്കുമ്മി വൃത്തിയ മൂട ഷ്ഷഷമായ നാര $\frac{7}{12}$ നാര വരുന $\frac{4}{15}$?

3. ಘಾಭಿಸಿ ರಾಜಿ ಣಾಸ್ತ್ರಜ್ಞಾ ಡಿಚಿಡುಕಾಣಿಚಿಟ್ ಟಿಹಾಕಾಭಾಷ್ಟ

$$\frac{-11}{28}$$
 , $\frac{-5}{7}$, $\frac{9}{-14}$, $\frac{29}{-42}$ ρ solve the reference ?

- (o) $\frac{-11}{28}$
- (a) $\frac{-5}{7}$

- ಘಚಿಣ ಟಿಕಾಟುವಾಮ ,ನರಾಂಟಜ ಛಾಜ,ಕಾಂಭಾರತಚಿಳಿರಲಾಜಾ ಜಿಡಲು $\Box rac{3}{5}$ ೧೦೦ರಾ $\Box 2$?

- ಕಾಸ್) ರಾಜ ರಾಜಜನಾಗುವುದು ಗ್ರಹ್ಮವಾಗಿ ೧೩೮ ರಾಜಕುವುದು ಅನರ್ಜಕುವುದು ಅನರ್ಜಕುವುದು ಅನರ್ಜಕುವುದು ಅನರ್ಜಕುವುದು ಅನರ್ಜಕುವುದು ಅನ
 - (o) $\frac{-12}{26}$
- (i) $\frac{-49}{91}$ (ii) $\frac{-9}{16}$
- නාස.ක් ටෙස ශමට ඔස්ගාණ්සේස් සික්සැකම ho ho3. නස් වේස ටෙස ගැස සික්සැකම ho ho3, ලාදස වශසෙනි සික්සැකම ho3 :-
- (a) $\frac{-19}{3}$

- 7 . වේදන කෘත්ථා අතා ලක් $\left(-\frac{9}{16} \times \frac{8}{15}\right)$ $\wp:=$

- (영) 🗆

- ಖുස මසුදුරුම් ලදා ස්විධ විධාන විධාන
 - (o) ಖ ಚಿ ತರ್ಧಾತಾಜತೀಚಣಾಹುಚಿಟ ಟಿಹಾಯಾವಾಡಿ
 - (ಃ) ಋ ಚ ಟಿಜಾಚಿರಾಹಾ ಡಚಿರಾಹುಚಿಟ ಟಿಹಾಯಾಮೌ
 - (ම) මප්ස් ආසනාවෙක් ප් මතාවෙක මේ ප් ස්කාශ්තාවක මිස්තාවේස්ස් ස්වේතාවෙක්
 - (ಆ) ಆಹಜ ಟಿಹಾ ಜಾಭಾ
- 9. Ships with the $\left(\frac{-5}{9} \div \frac{2}{3}\right)$ $\rho :=$
 - (o) $\Box \frac{5}{2}$
- (a) □ 2

- 1~0 . \rightarrow ជាដំបើ ជំ ខានុង ជុំដំបើង $: \frac{4}{9} \div (\dots) = \square \frac{8}{1~5}$
 - (o) $\square \frac{32}{45}$ (i) $\square \frac{8}{5}$

ಖಾಗು ಎಇಅಖಿ ಋಗಿ ಇ ಖಿಜಕಾಇ ಕಿಗಾಇ ಖುಖಿ ಋಔಓಖ

ි්තුනක වාශාමිනනී O වනතුතුන වේකතුතු ජීලාකුනන් කිසින

තුන්ට ප්රවිධිමේමන්තන විධිමේන්මතාක ස්ථාන්ස

(a)
$$\Box \frac{2}{3} \times \frac{3}{5} + \frac{5}{2} - \frac{3}{5} \times \frac{1}{6}$$

(a)
$$\frac{2}{5} \times \left(-\frac{3}{7}\right) - \frac{1}{6} \times \frac{3}{2} + \frac{1}{14} \times \frac{2}{5}$$

ಫಾಹಾರ್ಯ ಮುಜ್ಜ ಚಿಜಜಾರ್ಯ ಚಿತ್ರಾಣ ಜಾಜಿ ಜಾಜಿಯ ಮುಜ್ಜಿ ಮುಜ್ಜಿ ಬಿಡುಗಳು ಮುಜ್ಜಿ ಬಿಡುಗಳು ಮುಜ್ಜಿ ಬಿಡುಗಳು ಮುಜ್ಜಿ ಬಿಡುಗಳು ಬ

(3)
$$\frac{2}{8}$$

(a)
$$\frac{-1}{0}$$

(a)
$$\frac{2}{8}$$
 (b) $\frac{-5}{9}$ (c) $\frac{-6}{-5}$ (d) $\frac{2}{-9}$ (e) $\frac{19}{-6}$

(a)
$$\frac{19}{-6}$$

ಗಜಾಮೀಥಿ ಣುಚಿಣ □ (□Φ) = ಧಜಿಯಾ 3.

(3)
$$\varphi = \frac{11}{15}$$

(a)
$$\varphi = \Box \frac{13}{17}$$

ಈು ឃើន ការុឌ សាស់កោលស៊េឃុំជាការនេះ ឃើងគោគ្ន បាន ការុឌ ឌី០ស់ស៊េចទីឃើប:

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

(3)
$$\Box$$
 13 (a) $\frac{-13}{19}$ (a) $\frac{1}{5}$ (b) $\frac{-5}{8} \times \frac{-3}{7}$ (c) \Box 1 \circ $\frac{-2}{5}$

(a)
$$\Box$$
 1 $_{\circ}$ $\frac{-2}{5}$

(a)
$$\frac{-4}{5} = 1 = 1$$
 \circ $\frac{-4}{5} = \square$ $\frac{4}{5}$ (a) \square $\frac{13}{17} \times \frac{-2}{7} = \frac{-2}{7} \times \frac{-13}{17}$ (a) $\frac{-19}{29} \times \frac{29}{-19} = 1$

(a)
$$\Box \frac{13}{17} \times \frac{-2}{7} = \frac{-2}{7} \times \frac{-13}{17}$$

$$\frac{-19}{29} \times \frac{29}{-19} =$$

6. Simple 3 from
$$\frac{1}{15}$$
 (3) $\frac{-3}{7}$ from $\frac{12}{14}$ (3) $\frac{-7}{12}$ from $\frac{-5}{18}$

(a)
$$\frac{-3}{7}$$
 from $\frac{12}{14}$

(a)
$$\frac{-7}{12}$$
 from $\frac{-5}{18}$

7. Substituting : (a)
$$\frac{7}{42} - \frac{8}{21}$$
 (b) $\frac{2}{15} - \frac{-4}{5}$ (c) $\frac{-7}{12} - \frac{-8}{15}$ (d) $\frac{5}{24} - \frac{-17}{-36}$ (e) $\frac{-8}{15} - \frac{5}{18}$ (e) $\frac{2}{9} - \frac{-5}{12}$

8. Substituting : (a) $\frac{2}{3} + \frac{5}{6} - \frac{7}{12}$ (b) $\frac{-4}{9} - \frac{-2}{3} + \frac{5}{12}$ (c) $\frac{7}{18} + \frac{-5}{16} - \frac{2}{9}$

$$\frac{7}{100} + \frac{-5}{100} - \frac{2}{100}$$

- (ು) ಂಡಜ ಡಚಿಣುವಟಿಚಿಟ ಟಿಹಾಮಭಾವಾ ಚಿಟತಿಚಿಂ, ಛಿರಾಮಾರಾಚಣುತಾಜ ಹಾಟಜಜಾಡಿ ಜಾತಾಮಟ್
- (ച) ഠിരു രിഷ്തുഷ്ഷ് ല്ത്യുഷ്ടെ ഷ്യീഷ്റ്റെ പ്രൂസ്ഷ്തുജ ത്യിയുക്ക് യും വൈസ്
- (ාං) පෙස්ඪ් ෂීස සාකෘසෙස 1 දාඛ 0?

10. Salid il says siddles: (a)
$$\frac{5}{16} - \left(-\frac{2}{3}\right) = \frac{5}{16} + \dots$$
 (b) $\Box \frac{2}{15} - \left(\frac{-7}{12}\right) = \dots + \frac{7}{12}$

(a)
$$\Box \frac{2}{15} - \left(\frac{-7}{12}\right) = \dots + \frac{7}{12}$$

(a)
$$\frac{-2}{7} \times \frac{-14}{11}$$

(a)
$$\frac{8}{-11} \times \frac{33}{-32}$$
 (b) $\frac{17}{3}$

12.
$$(3) \left(\frac{2}{3} \times \frac{15}{-16}\right) \Box \left(\frac{7}{12} \times \frac{-24}{35}\right)$$

$$\textbf{1.2.} \quad \text{ with Eight $: (3)$} \quad \left(\frac{2}{3} \times \frac{15}{-16}\right) \square \quad \left(\frac{7}{12} \times \frac{-24}{35}\right)$$

13. Azalusa raya socialistica (3)
$$\frac{2}{3} \times \frac{5}{6} = \frac{5}{6} \times \frac{2}{3}$$
 (3) $\frac{-34}{48} \times \frac{16}{17} = \frac{16}{17} \times \frac{-34}{48}$ (3) $\frac{-9}{20} \times \frac{35}{-27} = \frac{35}{-27} \times \frac{-9}{20}$

(a)
$$\frac{2}{3} \times \frac{5}{6} = \frac{5}{6} \times \frac{2}{3}$$

(a)
$$\frac{-34}{48} \times \frac{16}{17} = \frac{16}{17} \times \frac{-34}{48}$$

(a)
$$\frac{-9}{20} \times \frac{35}{-27} = \frac{35}{-27} \times \frac{-9}{20}$$

14. ಈ ಟೆಟಿ ಟಿ ಣಾಜಭಟಚಿಟೆಇ, ತುರಾಣ ಣಾಜಭಿಯಾಡಿಜಾಧಿಣ ಹೆಚ್ಚುಟಿ ಯಾಣ ರಾಜಿ >, = ಚಿಟಿಜ < : (3)
$$\frac{-3}{7}$$
.... $\frac{6}{-13}$ (3) $\frac{5}{-13}$ $\frac{-35}{91}$ (3) $\square 2$ $\frac{-13}{5}$

15. ಇಥಾದಿಇ ಜಾಕೀಸ್ ರಾಜ ಗುಸ್ಹ ಜಿಡುಟ್ರಾಹಿಸುಂ ಡಚಿಸಬಹುಚಚಿಟ ಟಿಗಾಸುಭಾವೇ ಹಾಗೆ ಸಂಚಟಿಜಚಿತಜ ಜಿಡರು: (3)
$$\frac{-14}{49}$$
 (3) $\frac{-36}{-63}$ (3) $\frac{24}{-64}$

EXERCISE-2

(FOR SCHOOL EXAMS)

ಖಾಗುಎಇಅಖಿಖಗಇ ಖಿಜಕಾಇ ಕಿ ಗಣ್ಣ ಖಖಿ ಖ ಔ ಓ ಖ

වාශාමිකන රැකුකුක වේ නෑකු ජීෆකුනානන්මියන

1. Arabana prove and this case (a)
$$\frac{2}{3} \times \left(\frac{3}{5} \times \frac{25}{18}\right) = \left(\frac{2}{3} \times \frac{3}{5}\right) \times \frac{25}{18}$$
 (a) $\frac{14}{15} \times \left(\frac{-3}{12} \times \frac{22}{-33}\right) = \left(\frac{14}{15} \times \frac{-3}{12}\right) \times \frac{22}{-33}$

3.
$$\frac{-3}{14} \div \frac{2}{7}$$
 (a) $1\frac{3}{4} \div \frac{-7}{8}$ (b) $\frac{-15}{14} \div \frac{-5}{21}$

(a)
$$\left(\frac{3}{5} - \frac{1}{2}\right) + \dots = \frac{3}{5} \div \frac{3}{4} - \frac{1}{2} \div \frac{3}{4}$$
 (a) $\frac{5}{6} \div \frac{2}{-3} = \frac{5}{6} \times \dots$

5. Substitively: (a) $\frac{4}{9} \div \frac{-5}{12}$ (b) $-8 \div \frac{-7}{16}$ (c) $\frac{-12}{7} \div (-18)$ (d) $\frac{-16}{35} \div \frac{-15}{14}$

6. Availably dependent code substitutions of colorest code with the content of the color of the colorest code with the colorest code with the colorest code with the colorest code with the colorest code of the colorest code with the colorest code of the c

(a)
$$\frac{13}{5} \div \frac{26}{10} = \frac{26}{10} \div \frac{13}{5}$$
 (a) $\left(\frac{5}{9} \div \frac{1}{3}\right) \div \frac{5}{2} = \frac{5}{9} \div \left(\frac{1}{3} \div \frac{5}{2}\right)$

$$(3) \frac{1}{5} \div \frac{1}{10} = \frac{1}{10} \div \frac{1}{5} \qquad (3) \left(\frac{9}{9} \div \frac{3}{3}\right) \div \frac{1}{2} - \frac{9}{9} \div \left(\frac{3}{3} \div \frac{1}{2}\right)$$

$$7. \qquad \text{Subjet all rays extractions: } (3) \frac{9}{8} \div (...) = \frac{-3}{2} \qquad (3) \quad (...) \div \left(\frac{-7}{5}\right) = \frac{10}{19} \qquad (3) \quad (...) \div (-3) = \frac{-4}{15} \qquad (3) \quad (\Box 12) \div (...) = \frac{-6}{5}$$

(a)
$$\left(\frac{8}{15} + \frac{6}{5}\right) - \frac{5}{12} = \frac{8}{15} + \left(\frac{6}{5} - \frac{5}{12}\right)$$
 (a) $8 \square \left(2\frac{3}{5} + 2\frac{5}{12}\right) = 8 \square 2\frac{3}{5} - 2\frac{5}{12}$ (a) $\frac{5}{2}\square 0 = 0 \square \frac{5}{2}$

$$oldsymbol{9}$$
 . ಒಮ್ಮಣಾಹಿಸಿಕ್ $rac{6}{13}$ ಭಾಧ ಣುಜಡಜಾಭಿಕಾಡಿತುಬೀಕು ತಾಜಿ $rac{-7}{16}$

$$1~0~.$$
 ත් $\frac{8}{9}$ ලාදස සාංචාෙලාවඩාරුසේලාකය ස්පාන්දෙස ලාස $\square~1\frac{1}{8}~?$ කුළු වේම පීදාඛ ස්ලාල $?$

නිසියණ රියනාංකුන නීකෘතු ජීෆතුනානන්සියන

11. නැතිසිනීම් :
$$\frac{4}{3} + \frac{3}{5} + \frac{-2}{3} + -\frac{11}{5}$$

$$12.$$
 ស្ 0.3 ការុឌ (ភាពិភេសាសែល្បាដាការនេះ ស់ខែកោរុឌ បាដ $3\frac{1}{3}$? គុះរុក្ បាន ខិរុក្ សំបាត?

13. නතාලික අතරේග ලාදක සිස්කුතෙකි සිට ලාදක සිස්කුතෙකි සිට්ක : (3)
$$\frac{7}{4}$$

14. නසාවිශාන්වෙහ
$$\frac{-2}{11}, \frac{-5}{11}, \frac{-9}{11}$$
 ලෝ හොදස එහිනුනෙහි එළුසි

$$1\,\mathbf{6}$$
 . ಈ ម៉ោង ១៧ ខែជាពាលដោយ ប៉ុកែសុលា ព្រះ១៤៧ $\frac{-2}{5}$ ដាំខែង $\frac{1}{2}$

17. ಈ ಹೆಚ್ಜ ಜಿನಾಜ ಡಿಚರಾಹ್ಚಿಚಟ ಟ್ರೀಸ್ಸ್ ಭಾರತಿಯಾಹಿ (3)
$$\frac{2}{3}$$
 and $\frac{4}{5}$ (3) $\frac{-3}{2}$ and $\frac{5}{3}$ (3) $\frac{1}{4}$ and $\frac{1}{2}$

18. ಫಾಮಾಣಜಜಿತಾಜಡಚಿಣುಕುಚಿಚಟಟೆಕು ಮಹುಮಾಡಾ ರಾಜಚಿಣಜಾಡ ಣುಚಟ □2.

19. satisfies :
$$\frac{-3}{10} + \frac{7}{15} + \frac{3}{-20} - \frac{9}{10} + \frac{13}{15} + \frac{13}{-20}$$

$$20$$
. മീവുജ, അവ നോഷ് നോഷ് വേഷ് വെഷ്ടുഷ്ട് വ് അവുഷ്ടു വ $\Box 6$ വില്യ വാഷ്ടു വാജ് നാവുഷ്ടു $\dfrac{-7}{2}$. ಈ വാഷ്ട നാവുഷ്ട

$$21$$
. သမ္းကျောင်းမိတိုက ကာများ ကျော် တာမီ ကာများ ကာမီဝ မီးကားကြောနော် ပု $\frac{-8}{5}$ မီမီးဆ $\frac{-5}{3}$ ಜಿಡಿಯ ကေးမာ္ ကား တာဗီ $\frac{3}{2}$ ಚಿಟಿಜ $\frac{-31}{28}$.

$$22$$
. නාස්ස දැකැටලෙ $4\frac{3}{4}$ සිටලෙමසු සිසිනෙ පීස්ස ඉතාස $3\frac{7}{8}$ සිටලෙමසු බවසිට විශාතමයි සී , එකොතල සෑට. ගෙලෙම සිටෙසෙ විසියිනෙ?

$$24$$
. o සාඅභි දැප් කු. 100 මාතා දාණ ගෙස දාණාතුල $3\frac{1}{2}$ සිහැබළු සුස් සාභි සු සිහ කු. $16\frac{1}{2}$ ලිසුබ් සිහැබළ ගෙමේ සිතුරී සිස්ස්තු ද සිසුස්ල මහතු දාණ

$$25$$
. සමස්ස්කානයේ දැකාලෙස $3\frac{1}{2}$ සි ලිපැතුක්සේ සිස කු. $5\frac{3}{7}$ මක්ම සාකාමක $4\frac{3}{4}$ සි අපිස්තාව සිස කු. $27\frac{1}{2}$ මක්ම සාකාමක ගෙමේ සිතුරු සිත්සික්ව සාකාමක $27\frac{1}{2}$ මක්ම සාකාමක ගෙමේ සිතුරු සිත්සික්ව සාකාමක වියුතුව සිතුරු සිත්සික්ව සිත්සික් සිත්සික්ව සිත්සික්ව සිත්සික්ව සිත්සික් සිත්සික්ව සිත්සික් සිත්සික්සික් සිත්සික් සිත්සික් සිත්සික් සිත්සික් සිත්සික් සිත්සික් සිත්සි

26.
$$: \bar{\varphi} \text{ new model } \bar{\varphi} = \frac{-3}{4} , \ \bar{\varphi} = \frac{2}{3} \text{ which } \bar{\varphi} = \frac{-5}{6} , \text{ weak which } \bar{\varphi} \text{ new hidth} :$$

$$(3) \ \bar{\varphi}_{\circ} \ (\bar{\varphi} + \bar{\varphi}) = \bar{\varphi}_{\circ} \ \bar{\varphi} + \bar{\varphi}_{\circ} \ \bar{\varphi} \qquad (3) \ \bar{\varphi}(\bar{\varphi} \ \Box \ \bar{\varphi}) = \bar{\varphi}_{\circ} \ \bar{\varphi} \ \Box \ \bar{\varphi}_{\circ} \ \bar{\varphi} = \bar{\varphi}_{\circ} \ \bar{\varphi}$$

$$(3) \ \bar{\varphi}_{\circ} \ (\bar{\varphi}_{\circ} \ \bar{\varphi}) = (\bar{\varphi}_{\circ} \ \bar{\varphi})_{\circ} \ \bar{\varphi} \qquad (3) \ \bar{\varphi}_{\circ} \ \bar{\varphi} = \bar{\varphi}_{\circ} \ \bar{\varphi}$$

$$f 2.7$$
 . ಖീഡുജ ලිශිලකසෑටුගෙ ලාසී ශාෂීල සිස්තුනෙකි. p $\Box 17rac{1}{2}$. හේසි ලාසී ලාසි ලාස්තු p $1rac{1}{6}$, සෝඩ්ස ලාදුස ලාදුස්ව.

$$28$$
. ಆഷ്ടങ്ങെ സുയ, അവ ൽ $\frac{-3}{4}$ ಚಿಟ್ಟ $\frac{-5}{12}$ എന്ന സുഷ്ക ർತിയാടുന്നെ.

$$29$$
. െ വുറുക്കെ ല്യായും $2\frac{1}{4}$ & එಟ್ರಾಯ. ಊರಾತಿ ಟಾಕಿಟ್ ಬಾರ್ಟ್ ಭಾಟ್ ಟ್ರಾಟ್ ಜಾರ್ಟ್ ಜಿಡಿರಾಸ $31\frac{1}{2}$ & ಭಿಟ್ರಾಯ?

$$30$$
 . වේදස් 1 හැකි විස්ථාවක, වසි 21 , ඇම්විස්ට මහේද $36\frac{3}{4}$ ව ජාත්ව වෙදස විස්ථාවක, වසි 1 මහේස

$$3.1.$$
 $17\frac{1}{2}$ අත විශාප්තඥා ආඛා කු. $166\frac{1}{4}$. ಈසේස ලාස ආඛා ලස් 1 අත විශාප්තඥා

32. ಖುಜ ಚಿಡಜಾಚಿ ರಾಜಿ ಚಿ ಡಾಜಾಭಾಣಚಿಟಿರಚಜನ
$$145\frac{5}{6}$$
 . a ಕು ಖಜ un $> 17\frac{1}{2}$ ಕು ಟರಚಿಂ, ಜಿಚುಜ un ತಿಂಡಾಣು.

$$\frac{1}{4}$$
 න $\frac{1}{2}$ න $\frac{1}{2}$ න $\frac{1}{2}$ න $\frac{1}{2}$ න $\frac{1}{4}$ $\frac{1}{4}$ න $\frac{1}{4}$ $\frac{1}{$

$${f 3.5.}$$
 មស់ខែ គេគ្រងនេះ ខែដាលយើដប់ ប៉ាក់ឈ្មេះ ឈ្មោះខេត្ត ${f \frac{1}{4}}$ and ${f \frac{5}{3}}$

$$oldsymbol{36}$$
 . ಈಚಿಜ ಜಿರಾಮ ಡಿಚಿಣಾಚುಚಿಟ ಟಿಕ್ಕುಮ್ çಾಮಾತಿಜಾಚು $rac{-7}{4}$ ಚಿಟಜ 1 .

$${f 3.7.}$$
 හේසුකාල සාකා ලසලස්සේස් සිත්කැක් දැකලමකාස් ${1\over 2}$ and ${5\over 4}$.

$$38$$
. හේසිකාව සින්සෙ ඔස්වාණ්ස්සි සිවිතුන්ව ආකාමනක්සේ අ සිසිසෙ ϕ මිදන්සේ අ $=\frac{-5}{9}$.

$$f 40$$
. නිදස ලිබලාසභෑවල ලස් ෆමල ලිස්ලාස්සේස් ස්ත්යානම් $f
ho$ වේ. නිස්ස ලස් ලාදස ස්ත්යානම් $f
ho$ $f \Box$ $f 12$, ස්සේස ලාදස ලාදසම්

$$41$$
. ಖുജ ർඛയാം സുന യൂ നൂർ രൂൻ വെൽവിൽ പ്രത്യാം $\frac{-16}{9}$. വെൽ വിയ യൂ നൂജ പ്രത്യാം $\frac{-4}{3}$. ഷിവ്യ നൂജ നുവുമി.

- f 42 . ുമ് ತಿ. വിവരാജ്യില് ക്രിയുമ്മ വനുക്കോടി ക്രിയുമ്പു വരുക്കു ക്രിയുമ്പു വരുക്കു വിവര് ${-5\over 7}$?
- 43. $\hat{\phi}$ ತಲ್ಲಿಗೂ ಡಚನಾಯಲ್ಲಿಕ್ಟ್ ಟ್ರಾಮ್ಸ್ ಸ್ಟ್ರಾಮ್ಸ್ $\frac{-8}{39}$ ರಾಜಕ್ಕ್ ಮಾಟ್ಯಾಪ್ಟ್ $\frac{1}{26}$?
- **44.** A square constant variety $\frac{-33}{8}$ the exercises one can $\frac{-11}{2}$?
- 45. පොමාසෙස ලාදස, බෝඩ සාසි $\frac{13}{5}$ ප්රාස $\frac{-12}{7}$ දැම ලාදස විශිලාසබාදීග සාසි $\frac{-31}{7}$ ස්රාස $\frac{1}{-2}$.
- $\frac{65}{12}$ ප්රිය $\frac{8}{3}$ ආරු බානාසි සාපීස්ක්මක්රීඑස
- 47. වාදස ැස්ට ලාස් ෆාමට විහාන්නෙක්ව $ho = rac{-8}{5}$ ස්විස ලාසි ලාසි ලාස ව $rac{2}{15}$, ස්වේස ලාස ලාදාසාව
- **48.** specific consider the statement of $\left(\frac{2}{3} + \frac{3}{5}\right)$ too teams $\frac{-2}{15}$?
- f 4.9. କୃଥିତ ,ଧ୍ୱଳଥିଷ ପ୍ରଥେଷଥରେ ଉତ $igg(rac{1}{2} + rac{1}{3} + rac{1}{5}igg)$ ଉତ ପଥରେ 3?
- $\mathbf{50}$. പൂപ്പോ വുവും വൈടെ വുടും പൂപോർഷ് എനായും ഷിർത് $\left(\frac{3}{4}-\frac{2}{3}\right)$ നര വുടും $\square \frac{1}{6}$?

- **1.** (a) 2 , (a) \Box $\frac{11}{28}$ **2.** (a) \Box $\frac{2}{8}$, (a) $\frac{5}{6}$, (b) $-\frac{6}{5}$, (c) $\frac{2}{9}$, (e) $\frac{19}{6}$ **4.** (a) $-\frac{1}{13}$, (a) $-\frac{19}{13}$, (a) 5, (b) $\frac{5}{15}$, (e) $\frac{5}{2}$, (e) \Box 1
- 5. (3) 1 ρ Embliosoluby 2002 see see see see see see (3) eventure 2002 (3) ρ Embliosoluby 2002 (3) ρ Embliosoluby 2002 (3) ρ (4) ρ (5) ρ (7) ρ (9) ρ
- 7. (a) $-\frac{3}{14}$, (a) $\frac{14}{15}$, (a) $-\frac{1}{20}$, (b) $-\frac{19}{72}$, (c) $-\frac{73}{90}$, (d) $\frac{23}{36}$ 8. (a) $\frac{11}{12}$, (a) $\frac{23}{36}$, (a) $-\frac{7}{48}$,
- 9. (3) £5 (3) £5 (3) £5 (3) £6 (3) £6 11. (4) $-\frac{9}{8}$, (5) $\frac{4}{11}$, (3) $\frac{3}{4}$, (3) $-\frac{5}{2}$, 12. (4) $-\frac{5}{2}$, (3) $-\frac{9}{40}$
- 14. (3) >, (3) =, (3) >, 15. (3) $-\frac{2}{7}$, (3) $\frac{4}{7}$, (3) $-\frac{3}{8}$

- 3. (3) $-\frac{3}{4}$, (3) \square 2, (3) $\frac{9}{2}$ 5. (3) $-\frac{16}{15}$, (3) $-\frac{128}{7}$, (3) $-\frac{2}{21}$, (3) $-\frac{32}{75}$ 6. (3) ಈಚಟ್ಟಜ(3) ಈಚಟ್ಟಜ(3)
- 7. (3) $-\frac{3}{4}$, (3) $-\frac{14}{19}$, (3) $\frac{4}{5}$, (3) 10, 8. (3) නිඛණය (3) නිඛණය (3) ජාස්ස්ස 9. $-\frac{96}{91}$ 10. ඩල ආස්ස්ස්ස ලාස මිශිලාස්කිත වූ ස්ලා

- 11. $-\frac{14}{15}$ 12. we canded from the decorate of the second of the s
- 22. $\frac{7}{8}$ Litre 23. 60 erb 24. $42\frac{1}{4}$ 25. a. $149\frac{5}{8}$ 27. \Box 15 28. $-\frac{56}{15}$ 29. 14 April 30. $\frac{7}{4}$ 31. a. $\frac{19}{2}$
- 32. $\frac{25}{3}$ m 33. 8. $\frac{45}{2}$ 34. $159\frac{1}{2}$ 40. $\frac{3}{4}$ 41. $\frac{4}{3}$ 42. $\frac{8}{3}$ 43. \square $\frac{3}{16}$ 44. $\frac{3}{4}$ 45. $\frac{2}{5}$ 46. $\frac{97}{33}$ 47. $-1\frac{11}{15}$
- **48.** $-\frac{7}{5}$ **49.** $\frac{59}{30}$ **50.** $\frac{1}{4}$

EXERCISE-3

(FOR SCHOOL EXAMS)

ಕಾಔಖಐಆ ಕುಲಾಔಃಐಇಒಖ ಖಿಜಕಇ ಕಿಗ್ಇಖಾಖಿದ್ಔಓಖ ಔಈ ಖ೦ಬಿದ್ಔಓ೦ಐ ಓಗ್ಒಃಇಖಖ

- $rac{2}{7}$ on ಚ ¢ிடுஷுறுவு നത്ത ங்கூஷ், $rac{2}{7}$ മാൻ നൂടു, രിഷൂനങ്ങൾ, ತಿഷ്ണയൾ ಚ ¢ എമ്മാർ കോർ വിവ്യൂ വിവ്യൂ
- 2 . හිසි $\frac{3}{5}$ හාසි ස් විශේෂානාලි සැඳවසොනු යැද $\frac{2}{7}$ දැලි 44, සින්සෙ ලාදස විශේෂානාලි.

- $\frac{7}{9}$ රස්ලාක් ශික්ස්සාවේට $\frac{7}{9}$ ලාසී ස් දැමලෙදා, 40 ගිස්ලාක ස්ශික විකාස්ග. ගෙමෙම් කැස්වේඛ ගිස්ලාකි සිශික බැස්මෙන් නැත දැමලෙදා?
- $m{6}$. හේස් ප් ,දා)ා ලාස්, $m{\frac{5}{8}}$ ලාස ලාදා ,ලබාසස්ස්වල ප්ඛස ආඛා. හස් ලාදාකිස ප්ඛස 240 ටැබ්දා, ස්ස්වස ලාදා ස්විතාන ලාස ආඛා ස් ලාදා ,දා) ලාස්ඩ
- 7 . ಖീയ മരിയാടുക്കുനെ യായ നാഷ്യ ജീൻപ്റ്റോക്സ് ു $9\frac{3}{5}$. ಖായ യാംഗ്യമയായ നാവയ ജീൻപ്റ്റോക്സ് ു $9\frac{3}{7}$, ഷാംഗ്യ നാവയുട്ടു.
- 8. ಮೀಜ ಚಿಡಿಡಚಿ ರಾಜಿ ಚಿ ಡಿರಾಮ ho $65\frac{1}{4}$ ಟಿ. ಋಜಿ ಗಾ ಭಾಡಚಿಕಣಾ, ho $5\frac{7}{16}$ ಮೂರಾಡಿಇ ಘಾಚಿಣ ho ಸಾ ಟಡುಬಿರಾನ್?
- $\mathbf{9}$. o ಛಿಡಾಜ ರಚಿ ಟಜುಬಿರಾಂ, $71\frac{1}{2}$ ಓುಚಿ, ಛಾಜುಬಿ ಛೀಗಾಂ ಹುಂದಿ ರಿ ರಿಯಾಭಿಇ ರಚಿ ಜಾಹಾಚಿಟ ಟಜುಬಿರಾಂ, ಘಟಿಗಾ ಎಂದು ಬಚುಬಿರಾಂ, ರಚಿ ಜಚಿಭಿ, ರಿಯಾಭಿಜು
- 10. ಖുಜಳೀರಾ ರಾಜಿ $3\frac{1}{2}$ ಕಾರ್ಚಾಡಿಇ ರಾಜಿ ಭಿಟರಾಣ್ಯ ಸರ್ಖ. $57\frac{3}{4}$. ಘಟಿಚಾ ಸರಾಜ್ ಭೀರಾ ರಾಜಿ ರಾಟಿಜ ಕಾರ್ಚಾಡಿಜ ರಾಜಿ ಭಿಟರಾಣ್ಯ?
- $1\,1$. oli ಚಿഷുക്കില്ഷ്യ്ജ എതുഷും 1020 ಇಟಹು ಚಿಟ್ ಸಹಾಹ ಚಿಟ್ ಸಹಾಹ ಕಾಣಿ ಕಾಣಿಸಿ ಭಾಗಚಿಟಿಳಿಜ ತಿಹುಟ ಸಂ ಭಿರಾಮಾ ಹ $4\,rac{1}{6}$ ಸ್ಥಾಣಿ.
- 12. මිස්ස ඩාවාශිස වසි විසාවශීවේ එවා. කු $46\frac{3}{4}$. කුප්ප ρ හැස එවා. වසි 35 ඩාවාශිස වසි විසාවශීවේ?
- $1\,3$. ಈාಖ්ස ලාදස ප්ටිසාවේ ලාසි වේ ,ශැමාවිශිස විවිශල ලාසි විවේඩිස මීටුළාස සාවේදීට ,ශාස සිතාවිශිස $8\,rac{1}{2}$ සිතාවෙලිස
- 14. ಈುಟಿಜ ಣುಸಜಚಿಡಿಜಾಕಿ ಹಾಜಿ ಚಿ ಡಿಜಾಭಿಣಚಿಟಿ**ರಾ**ಟಚಿಡಿ ರಚಿಡಿಜ್ ತಿನಾಭಿ ρ 36 $\frac{3}{5}$ ಓ ಟರಾಟಿರ ಚಿಟಿಜ $16\frac{2}{3}$ ಓ ಭಾರಾಚಿಜ.
- 15. o ಭಚಿತ ho ಟಾಹುಟಿಂ ಚಿಣ ಚಿಟಿ ಚಿತುವಾಹಿಚಲು രഷക ರಜಿ $40\frac{2}{5}$ $m Trivial 2008. തെൽ ಟ್ಯಾಬ್ಗ ಜೂಗಾಚಿಟಿಳಿಜ ತಿಂಟಟ ರೂ ಭಿರಾಮಾ ರಚಿ <math>7\frac{1}{2}$ ho ho
- $1\,6$. ජාණ්ස ලාස එලා වස් $3\,rac{2}{5}$ ජාකාලෙස වස් එහිවලා ස්ල කු $36\,rac{3}{4}$ වන්ව ජාකාලෙස
- 17. ಔಟಿ ಡುಪಿಜ ಜಚಿಥ ಚಿ ಡುಭಿಞಾಸಚಿತಿ ರಾಹುಟಜಾಡಿ ಜಾಚಿಡಟಿಜಾಜ ಖ 80. ಔಕಾಣ ರಾಜಿ ಭು ಜಾಚಿಡಟಿಯಿರು ಸ್ಥಜ ರಾಜ್ಯಿಣ ಖ $13\frac{3}{5}$ ಡುಪಿ ಣಜಾಚಿ ಚಿಟಿಜ ಟಿಚಿಭಿಞಾ, ಖ $25\frac{1}{2}$ ಡುಪಿ ಜೀಡಾಜ ಚಿಟಿಜ ಖ $4\frac{2}{5}$ ಡುಪಿ ಡಾಜಾಚಿಚಿತ, ರಾಜೀ ಡಾಭಿಞಾಸಚಿತಿ. ಊರಾತಿ ಟ್ಯಾಭಿಸ ಜಾಜ ಸಹ ಸಚಿಮಾ ಡುಪಿ ರಾಭಚಿಣ ಜಚಿಥಿ?
- 18. ೦ ಛಾಸಿಶ್ರಜ್ಞಾ ಭಿರಾಣಿಕಾಟಿಕ್ಕೆ ಸ್ಥಾನಜ್ಜಾ ಸಂಭಾಜಕ ಸಾಧಿಕಾಣ ತಿಂತಾಗುಂತೆ $19\frac{1}{3}$ ಇರಂತಂ ಚಿಟ್ಟ. ಮಜೆ $8\frac{1}{9}$ ಇರಂತಂ ಸಂಭಾಜಕ್ಕು ಚಿತ್ರಕ್ಕಿ ಇರಕ್ಕು ಪಡಚಿಸಿರು. ಬಿಟ್ಟಿ ಸಂಭಾ ನಿರ್ಧಾಣಕ್ಕೆ ಸ್ಥಾನಿಸಿಕ್ಕಾಗಿ ಸ್ಥಿನಿಸಿಕ್ಕಾಗಿ ಸ್ಥಾನಿಸಿಕ್ಕಾಗಿ ಸ್ಥಾನಿಸಿಕ್ಕಾಗಿ ಸ್ಥಿನಿಸಿಕ್ಕಾಗಿ ಸ್ಟಿನಿಸಿಕ್ಕಾಗಿ ಸ್ಥಿನಿಸಿಕ್ಕಾಗಿ ಸ್ಟಿನಿಸಿಕ್ಕಾಗಿ ಸ್ಟಿನಿಸಿಕ್ಕಾಗಿ ಸ್ಟಿನಿಸಿಕ್ಕಾಗಿ ಸ್ಟಿನಿಸಿಕ್ಕಾಗಿ ಸ್ಟಿನಿಸಿಕ್ಕಾಗಿ ಸ್ಟಿನಿಸಿಕ್ಕಾಗಿ ಸ್ಟಿನಿಸಿಕ್ಕಾಗಿ ಸ್ಟಿನಿಸಿಕ್ಕಾಗಿ ಸ್ಟಿನಿಸಿಕ್ಕಾಗಿ ಸಿನಿಸಿಕ್ಕಾಗಿ ಸಿನಿಸಿಕ್ಕಾಗಿ ಸಿನಿಸಿಕ್ಕಾಗಿ ಸಿನಿಸಿಕ್ಕಾಗಿ ಸಿನಿಸಿಕ್ಕಾಗಿ ಸಿನಿಸಿಕ್ಕಾಗಿ ಸಿನಿಸಿಕ್ಕಾಗಿ ಸಿನಿಸಿಕ್ಕಾಗಿ ಸಿನಿಸಿಕ್ಕಾಗಿ ಸಿನಿಸಿಕ್ಕಿಸಿಕ್ಕಾಗಿ ಸಿನಿಸಿಕ್ಕಾಗಿ ಸಿನಿಸಿಕ್ಕ
- 19. െ ജർൺ ജീൺಟಿ തൂർ രാഡ്യ എയ്യ എയ്യ എയ്യ തുരു ഷായാനെ ഒരു ഉപ്പെട്ടു തുരു എയ്യ തുരു എയ്യ തുരു എയ്യ വി തുരു ജർൺ
- 20. ජාඛලාධ් සී ඔබසෙ 11 රා රාල්ට, ශාමල ලාකුළෙදා ලක් රාක්ථලාදා 2 $\frac{3}{5}$ රා ස්ථාක 3 $\frac{3}{10}$ රා ස්ථාක අමත ලක්කි. කුස්හ , හදක රාක්ථලාදා ලක් හදක සික්කිස්ථාඨ්ථව මා ලබ ක?

ಔಃಎಇಅವಿವರಿಗಇ ವಿಜಕಾಇ ಕಿಗ್ಇವಾವಿವ್ಔಓಐ ಔಈ ಖಂಪಿವ್ಔಓ೦ಐ ಓಗ್ಒ:ಇಖಮ

வெது முகை என்ற விரும் காத்திரை இருக

- 1. ആപ് െയായ തുടയ്ക്കില് തോയ് നയ്തയ്യായ് നേരി അംജി
 - (೦) ಇತುವಾಥಿ ತಿಳುಮೇಜಟ್ಕಾಮಾಡು ಚ ಟಚಣಕಾಡಚಿಟ ಟಿಹಾಮಾಡು
 - (:) තුමාකිඛ සීස්බම්බස්ස් සීම්බම්බ ද සී මාල්සෙස්මාමකිම
 - (ඏ) '1' ා බාෙස සිංහා මාල්සෙස් සිංහානාම
 - (ಆ) ಓෂ්ඨස ලාසී බාදුස
- - (o) $\frac{2}{3}$

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

(ω) $\frac{4}{5}$

- $(\mathfrak{G}) \frac{1}{2}$
- 3. ಮೀಜ ಣತಿರ ಟೂಟಿರ ಟಿಕಾಟಭಾವಾ ಸಂತಿಟಿ ತುರಾಸ ಭರಣವಾಸುಲ್ ಹುಟಿ ರಾಜಜವಾಜ್ನರಾಹುಟಿ $5\frac{3}{*} imes imes rac{1}{2} = 19$ ಚಿತಜ :-
 - (0) 6, 3

(8) 7. 3

(es) 8.

(e) 11, i

- 4. ಘೂಮು ರಾಜಿ ಣಾವಜಜಾಯಟರಾತಿಯಿಂದು ನಾಚಕಾಯಯವು ನಾಡಿಕಾಯ
 - (o) $\frac{-2}{3} < \frac{4}{-9} < \frac{-5}{12} < \frac{7}{-18}$

(i) $\frac{7}{-18} < \frac{-5}{12} < \frac{4}{-9} < \frac{-2}{3}$

(ω) $\frac{4}{-9} < \frac{7}{-18} < \frac{-5}{12} < \frac{-2}{3}$

- (e) $\frac{-2}{3} < \frac{-5}{12} < \frac{4}{-9} < \frac{7}{-18}$
- $rac{-9}{8}$?
 - (o) $\frac{-1}{2}$

(8)

(e) $\frac{12}{15}$

(ಆ) ಓල්ඨසෙ ලාසි බාදාස

- **6.** 0.018 ಭಚಟ ಛಾಜ ಜಾಘಾರಿತಭಾಜ ಹಲಿ ರಾಜಾ ತಚರಾಹಾಟಿಚಟ ಜಿಯಾಟಚ :
 - (o) $\frac{18}{1000}$
- (a) $\frac{18}{990}$

- (ω) $\frac{18}{9900}$
- $(e) \frac{18}{000}$

- 7. కిష్మిజ కుంకెట్కుంట రాజి 4 \square $\frac{5}{1+\frac{1}{3+\frac{1}{1}}}$ \wp
 - $(\circ) \frac{40}{21}$

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

(e) $\frac{1}{8}$

- (e) $\frac{31}{40}$
- 8. පාලාංක ලාදක ඔස්ලාන්සේස්ස්ස් සිත්කුනෙකි මිනුනුදා සලාසු සිලලා සිනාක ආකාලමකන්සේ ඔස්ලාන්සේස්ස්ස් සිත්කුනෙකි \Box $\dfrac{2}{5}$ සිසිස \Box $\dfrac{1}{5}$:
 - (o) $\Box \frac{1}{4}$

- (a) $\Box \frac{3}{20}$
- (ω) \square $\frac{3}{10}$
- (ಆ) $\Box \frac{7}{20}$

- 9. ಫಾಫ್ನು ರಾಜಿ ಣಾ!ಜಜಿರಾಟಟರಾತಿಯಿಂದು ಜಿಡಚಳಿಣಗಾಯಿ ಹಿ ಚಿಳಿಜಾಮಿಜಯಿಂದಾ ಜಜಾತಾ?
 - (o) $\frac{2}{3}, \frac{3}{5}, \frac{7}{9}, \frac{9}{11}, \frac{8}{9}$

(a) $\frac{3}{5}, \frac{2}{3}, \frac{9}{11}, \frac{7}{9}, \frac{8}{9}$

(e) $\frac{3}{5}, \frac{2}{3}, \frac{7}{9}, \frac{9}{11}, \frac{8}{9}$

 $(\mathfrak{G}) \ \frac{8}{9}, \frac{9}{11}, \frac{7}{9}, \frac{2}{3}, \frac{3}{5}$

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10.	ಘಾಸು ರಾಜಿ ಣಾ\ಜಜಿಡುಟರ ಾ ಪಿಟ್ರಜಿಡಿ	ಿಂದಾಮ್) ಟಘ ಣುಚಟ $\frac{7}{8}$ ಚಟಿಜ ಡಾಂ	ഷാംഗത്തെ സൂഷ്യ് $\frac{1}{3}$?		
	(o) $\frac{1}{4}$	$(\epsilon) \ \frac{23}{24}$	(w) $\frac{11}{12}$	(e) $\frac{17}{24}$	
11.	$5 \Box \left[\frac{3}{4} + \left\{ 2\frac{1}{2} - \left(0.5 + \frac{1}{6} \right) \right\} \right]$	$\left[-\frac{1}{7}\right]$:-			
	(o) $2\frac{23}{84}$	(a) $3\frac{1}{6}$	(ω) $3\frac{3}{10}$	(e) $5\frac{1}{10}$	
12.	ණස 2805 ÷ 2.55 = 1100,	ಣ್ಯುಜ್ಜರಿ 280.5 ÷ 25.5 =			
	(0) 1.1	(%) 1.01	(w) 0.11	(e) 11	
13.	තුම්ඩිණ්ඩිතස: $\frac{8 - [5 - (-3 + 5)]}{ 5 - 3 - 5 - 5 }$	2)]÷2 ·8 ÷3		1.0	
	(0) 2	(%) 3	(e) 4	(ಆ) 5	
14.	ಮೀಜ ತಚಿಟಿಕಾಜ ರಾಜಿ $0.\overline{4}$ $\wp:-$		_0		[ఓబిఖ్య-2008]
	(o) $\frac{4}{10}$	(i) $\frac{4}{9}$	(e) $\frac{4}{100}$	(e) $\frac{9}{4}$	
15.	හස ය යැගිස ආස්ඛසර්යේගෑමයේ	හි සිත්තානි ,තාව ලාස්ත $\left(rac{1}{a} ight)^{rac{1}{b}}=0$			
	(0) 81	(8) 24	(అ) 192	(e) 375	
16.	හස අ < □ 2, හොප්ඨ 11 □	। । 1 + ପ୍ରଧା ଅନ୍ୟକଥି ଧି :)	I	[ఓబిఖ్య-2008]
	(o) 2 + φ	(s) ф	(e) 🗆 Þ	(eg) \Box (2 + q)	
17.	නිාස පෘෂ්චිණාස ලාසී ලාදස සැටමේ අත	0.777+0.333+0.2	<u>22</u> 22 ා සැකැස්ස් කට:		
	(o) $\frac{7}{162}$	(s) $\frac{162}{7}$	(e) $\frac{163}{7}$	(e) $\frac{7}{163}$	
18.	ಮುಜ ಜಾಕಾರಾಭಾಕು $\frac{1}{1.2} + \frac{1}{2.3} + \frac{1}{2.3}$	$\frac{1}{3.4} + \ldots + \frac{1}{n(n+1)} \text{and} \text{with}$	ಥ ಟಿಚಣಹಾಡಿಚಟ ಟಿಹಾಜಾಜಾ ಟಿ.):		
	(0) 0ඩ්ෂීප්ඛ මෙස්ජිතකම කාප්ඩ්	1			
	(ඃ) රඩ්ෂීය්ඛ ඩිද කැයිඩ් 1				
	(ಅ) රස්ෂීಚ්ඛ කෘෂෘ්ස් කර 1				
	(ಆ) ಓගා සකෘත්රාවෙස				
19.	කුසෝ ,නාවඩාස්කය ලාදස විධිවස	$\left(1 - \frac{1}{3}\right) \left(1 - \frac{1}{4}\right) \left(1 - \frac{1}{5}\right)$	$\ldots \left(1-rac{1}{n} ight)$ स्टब्स्टिस् :		
	(o) $\frac{1}{n}$	(i) $\frac{2}{n}$	(ω) $\frac{2(n-1)}{n}$	(ಆ) $\frac{2}{n(n+1)}$	

$$oldsymbol{2}$$
 $oldsymbol{0}$. වේදන මැපිණිනක ලක් $\left(rac{X^b}{y^c}
ight)^{rac{1}{bc}} imes \left(rac{X^c}{y^a}
ight)^{rac{1}{ca}} imes \left(rac{X^a}{y^b}
ight)^{rac{1}{ab}}$ $\wp:$

$$(:) \frac{1}{\mathbf{v}}$$

$$2 \ 1 \ . \quad \text{slya with the two signs and signs and signs in } \frac{1}{1 + x^{a-b} + x^{a-c}} + \frac{1}{1 + x^{b-c} + x^{b-a}} + \frac{1}{1 + x^{c-a} + x^{c-b}} \ \text{, a signs in }$$

(
$$\omega$$
) $\frac{1}{\mathbf{v}^{a+b+c}}$

$$2 \ 2 \ . \quad \left(\frac{a^{-1} \ b^{-1}}{a^{-1} + b^{-1}} - \frac{a^{-1} \ b^{-1}}{a^{-1} - b^{-1}} \right) \ \text{ where it is not }$$

(a)
$$\frac{2b}{b^2 - a^2}$$
 (a) $\frac{2b}{a^2 - b^2}$

(a)
$$\frac{2b}{a^2 - b^2}$$

$$(\mathfrak{G}) \ \frac{2a}{b^2 - a^2}$$

(e)
$$\frac{2a}{a^2-b^2}$$

$$oldsymbol{23}$$
 . ಖുജ ജജൂസ്പെല് മെയ്യുക്കുന്നായിരുക്കുന്നായി വായ $oldsymbol{27}{400}$ $oldsymbol{
ho}$:

(o) ಖಿಜಾಹುಟ್ಟಿಚಚಾಟಿರ

(ಅ) ಓಹಟ-ಣಜಾಹುಟ್ಚಿಕಾಟ್ರಟ್ಹಿ ಡಿಜ್ಞಾಹಾಮ್ರ

(ಆ) ಓಡುಬಜ ಡಾಜಿ ಣು,ಭಾಜ

24.
$$2.2\overline{34} =$$

(o)
$$\frac{1101}{495}$$

(a)
$$\frac{1103}{495}$$

(e)
$$\frac{1106}{495}$$

(e)
$$\frac{110}{495}$$

25. ಘಾಘು ರಾಜಿ ಣು,ಜಜಿಯಾಟಿರಾಹಿಮಿರಟಿಕಾಯಾವಾಡಿ ಚಿಡಜಡಚಿಣುಹಾಟಿಚಿಟ ?

(o)
$$\sqrt{19}$$

(a)
$$\sqrt{16}$$

(e)
$$\sqrt{18}$$

26. වීටක ඕප්සාවාන්සේස් ස්වෘති නොස් $2.74\,\overline{35}$ ා :

(o)
$$\frac{27161}{9999}$$

(a)
$$\frac{27}{99}$$

(
$$\omega$$
) $\frac{27161}{9900}$

$$(e) \frac{27161}{9000}$$

(o) $\frac{27161}{9999}$ (a) $\frac{27}{99}$ 27. Ships with the cost $0.4\overline{23}$ p: (b) $\frac{423}{1000}$ (c) $\frac{419}{1000}$

(o)
$$\frac{423}{1000}$$

(a)
$$\frac{419}{1000}$$

(
$$\omega$$
) $\frac{423}{9000}$

(e)
$$\frac{419}{990}$$

$${f 2.8.}$$
 නස් ${f \phi}=$ $3+\sqrt{8}$ සිංගීම ${f \phi}=$ 3 $\square\sqrt{8}$ නොක්සි ${1\over x^2}+{1\over y^2}=$

(o)
$$\Box$$
 34

29.
$$1 + \frac{1}{1 + \frac{1}{1 + \frac{1}{3}}}$$
 β example 600 \Box

(o)
$$\frac{1}{3}$$

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

(e)
$$1\frac{1}{3}$$

30.
$$\frac{(x^{a+b})^2 (x^{b+c})^2 (x^{c+a})^2}{(x^a \times x^b \times x^c)^4} = 0$$

ස ොට කුළු නිස් වික						0	೦ ಭ ಉತ್ತುಚ ಖ ನ ಇ ಬ						102a) —4		
Que.	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Ans.	В	С	В	A	A	D	С	В	C	D	A	D	D	В	A
Que.	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
Ans.	D	A	C	В	D	D	D	A	С	В	С	D	В	В	C

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