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Techniques for Teaching Elementary Students Rational Numbers and Convenient ways to Perform Operations on Them

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ABSTRACT

This article describes new ways for school students to perform arithmetic operations on fractions.

KEYWORDS: Concept, fraction, set, fraction line, figure, denominator, decimal, number.

By adding the number zero to the set of natural numbers, we create a new set of numbers called the set of all negative numbers, and we use this extended set by N0 = {0, 1, 2, 3, ..., n,…} we define In order for a large number to be subtracted from a small number, the set of N0 numbers must be further expanded by adding new numbers.

Definition: When we say fractional number, we mean to be, that is $\frac{a}{b} = a : b$.

$\frac{25}{5} = 25:5 = 5, \frac{12}{4} = 12:4 = 3$

$\frac{a}{b}$ the number is a simple fraction, where a is the image of the fraction, b is the denominator of the fraction, and a, b are numbers. The following relationship is appropriate for fractions:

a) $\frac{a}{b} = \frac{c}{d}$ if ad = bc

b) $\frac{a}{b} > \frac{c}{d}$ if ab> bc

e) $\frac{a}{b} < \frac{c}{d}$ if ad <bc

g) $\frac{a}{b} = \frac{a*n}{b*n}; \frac{n*a}{n*b} = \frac{a}{b}$ or $\frac{a}{b} = \frac{a:n}{b:n} : \frac{a:n}{b:n} = \frac{a}{b}$

The main properties of the fraction:

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If the image of the fraction and the denominator are increased or decreased by the same number of times, its value does not change.

Fractions are of 2 types:

a) straight fractions; b) incorrect fractions.

✓ $4\frac{29}{51}+1\frac{7}{23}+3\frac{22}{51}$ add fractions.

Solution:

$$4\underline{\underline{\frac{29}{51}}}+1\frac{7}{23}+3\underline{\underline{\frac{22}{51}}}=4\underline{\underline{\frac{29}{51}}}+3\underline{\underline{\frac{22}{51}}}+1\frac{7}{23}=$$

$$=(4+3)+\frac{29}{51}+\frac{22}{51}+=7+\frac{29+22}{51}+1\frac{7}{23}=$$

$$=7+\frac{51}{51}+1\frac{7}{23}=7+1+1\frac{7}{23}=9\frac{7}{23}$$

Note: First you need to calculate the fractions of the same denominator, pay attention to the fractions underlined.

✓ $11\frac{5}{7}\cdot 4\frac{4}{11}-4\frac{4}{11}\cdot 6\frac{5}{7}$ Calculate.

A) $\frac{9}{11}$ B) E) $\frac{2}{5}$ D) $1\frac{1}{2}$

Solution:

$$11\frac{5}{7}\cdot 4\underline{\underline{\frac{4}{11}}}-4\underline{\underline{\frac{4}{11}}}\cdot 6\frac{5}{7}=4\frac{4}{11}\cdot(11\frac{5}{7}-6\frac{5}{7})=4\frac{4}{11}\cdot((11-6)+\frac{5}{7}-\frac{5}{7})=$$

$$=4\frac{4}{11}\cdot(5+\frac{5-5}{7})=4\frac{4}{11}\cdot 5=4\frac{4}{11}\cdot 5=\frac{48}{11}\cdot 5=\frac{48\cdot 5}{11}=\frac{240}{11}=21\frac{9}{11}$$

Note: $c\cdot a+c\cdot b=c\cdot(a+b)$ must be done in the fractional case. Notice the fraction underlined.

✓ $(3\frac{1}{4}+2\frac{1}{2}+\frac{5}{8})\cdot 24$ calculate.

Solution:

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$$(3\frac{1}{4}+2\frac{1}{2}+\frac{5}{8})\cdot 24=(\frac{13}{4}+\frac{5}{2}+\frac{5}{8})\cdot 24=\frac{13}{4}\cdot \underline{24}+\frac{5}{2}\cdot \underline{24}+\frac{5}{8}\cdot \underline{24}=$$

$$=\frac{13}{\cancel{4}}\cdot \underline{2\cancel{4}^{/6}}+\frac{5}{\cancel{2}}\cdot \underline{2\cancel{4}^{/12}}+\frac{5}{\cancel{8}}\cdot \underline{2\cancel{4}^{/3}}=13\cdot 6+5\cdot 12+5\cdot 3=153$$

Answer: 153

Note: $c\cdot(a+b)=c\cdot a+c\cdot b$ should be done in the decimal position, pay attention to the number underlined.

The correct fractions with a denominator of 10, 100, 1000, yoki or reduced to them are called decimal fractions.

For example: 0.7 =, $\frac{7}{10}$ 0.19 = $\frac{19}{100}=\frac{19}{10^2}$, 122,847 = $\frac{122847}{1000}$. A similar simple fraction can

be written as a decimal: $\frac{7}{10}$ = 0 . 7 , $\frac{19}{100}$ = 0 . 19 ....

The concept of decimal fractions and operations on them was discovered by the great astronomer and mathematician M. Ulugbek (1394 - 1449).

To convert a simple fraction to a vowel fraction, you must divide its image by the rule of dividing the vowel fraction by an integer.

For example: $\frac{9}{25}=\frac{9*4}{25*4}=\frac{36}{100}=0{,}36$

Agar $\frac{a}{b}$ such fractions are called infinitely fractional fractions if the image of the fraction is on its denominator and the division continues indefinitely. If the same numbers are repeated from a part of an infinite number of fractions, it is called a periodic fraction.

For example: $\frac{1}{3}=0{,}333....$

Here, the group of iterative numbers is called the fraction period. So the periodic fraction can be written as follows. 0.33. . . . . = 0, (3) 2,16171717. . . . . = 2.16 (17)

This means that any simple fraction can be written as a finite or infinite periodic fraction. Infinite periodic fractions can also be written as ordinary fractions. To do this, you need to subtract the number from the second period to the first period and write this difference in the picture, and write the number 9 in the denominator as many numbers in the period, and as many zeros as there are numbers between the first period and the comma.

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For example: $0,(3)=\frac{3-0}{9}=\frac{3}{9}=\frac{1}{3}$; $0,(44)=\frac{44-0}{99}=\frac{44}{99}=\frac{4}{9}$;

$3.1\,(44)=\frac{3144-31}{990}=\frac{3113}{990}$;

Note: Natural numbers are numbers used to count. It is defined as: $N=\{1,2,3,\ldots,n,\ldots\}$ .Natural numbers, opposite numbers to natural numbers, and the number 0 together are called integers. Z = {….-3, -2, -1,0,1,2,3….} $\frac{p}{q}$

($q\neq 0$) Numbers that can be written in fractional form are called rational numbers, e.g.

$Q=\left\{....-3,-2,-1,0,\frac{1}{2},1,2,.....\right\}.\frac{p}{q}$ ($q\neq 0$) Numbers that cannot be written in fractional form are called irrational numbers, e.g. $I=\{..,-\sqrt{3},-\sqrt{2},\sqrt{2},\sqrt{3},.....\}$

All rational and irrational numbers together are called real numbers:

$R=\{-\infty,+\infty\}$.

✓ –2.5 ni teskari sonni… ga teng.

Solution:

$$-2,5=-2\frac{5}{10}=-2\frac{\cancel{5}}{\cancel{10}}=$$

$$=-2\frac{1}{2}=-\frac{5}{2}\Rightarrow -\frac{2}{5}=-0,4$$

Note: If "-", it does not change until the end.

✓ $\frac{11}{25}$ va $4\frac{6}{11}$ What is the product of the inverse of the numbers teng.

Solution:

$$\left.\begin{array}{l}\frac{11}{25}\Rightarrow\ \frac{25}{11}\\ 4\frac{6}{11}=\frac{50}{11}\Rightarrow\ \frac{11}{50}\end{array}\right\}\frac{25}{11}\cdot\frac{11}{50}=$$

$$=\frac{^{1/}\cancel{25}}{1\cancel{1}}\cdot\frac{\cancel{11}}{\cancel{50}_{\backslash 2}}=\frac{1}{2}$$

Answer: 0.5

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Note: first the inverse is found and then multiplied.

Usually the student finds it difficult to understand the concept of fractions, but a student who understands correctly and completely performs operations on fractions with interest. If we explain these topics to them using fractional numbers and new convenient and fun ways for students to perform operations on them, it will lead to better retention in their memory. Students interest in the science of mathematics will further increase and their mathematical skills will grow.

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