

BE-Algebra I | MONDAY 9-21-09

① $\left(-\frac{2}{3}\right)\left(-\frac{1}{2}\right)$

② $-\frac{2}{3} + \frac{1}{2}$

③ $\frac{2}{3} \div -\frac{1}{2}$

④ $\left(-\frac{2}{3}\right) - \left(-\frac{1}{2}\right)$

⑤ Solve and check:

$$-\frac{2}{3}x + \frac{1}{2} = -\frac{1}{2}x + \frac{1}{3}$$

ANS

⑤ $-\frac{2}{3}x + \frac{1}{2} = -\frac{1}{2}x + \frac{1}{3}$

$+\frac{2}{3}x$

$+\frac{2}{3}x$

$$\frac{1}{2} = \frac{1}{6}x + \frac{1}{3}$$

$-\frac{1}{3}$

$-\frac{1}{3}$

$$\left(\frac{6}{1}\right) \frac{1}{6} = \frac{1}{6}x \left(\frac{6}{1}\right)$$

$$1 = x \quad \therefore \boxed{x = 1}$$

$$\left\{ \begin{array}{l} \frac{2}{3} - \frac{1}{2} \\ \frac{4}{6} - \frac{3}{6} = \frac{1}{6} \end{array} \right\}$$

$$\left\{ \begin{array}{l} \frac{1}{2} - \frac{1}{3} \\ \frac{3}{6} - \frac{2}{6} = \frac{1}{6} \end{array} \right\}$$

OK $-\frac{2}{3}(1) + \frac{1}{2} \stackrel{?}{=} -\frac{1}{2}(1) + \frac{1}{3}$

$$-\frac{4}{6} + \frac{3}{6} \stackrel{?}{=} -\frac{3}{6} + \frac{2}{6}$$

$$-\frac{1}{6} \stackrel{?}{=} -\frac{1}{6} \quad \checkmark$$

*Return Quiz 4
(time permitting)*

1.

OK

10

今

NOT ^{or} fraction

和

$$\left\{ \begin{array}{l} \text{RATIONAL} \\ \text{numbers} \end{array}, \begin{array}{l} \text{irrational} \\ \text{numbers} \end{array} \right\} = \text{REAL NUMBERS}$$

Name the set of numbers to which each number belongs:

0.6

RATIONAL, REAL

$\frac{1}{9}$

RATIONAL, REAL

$0.\overline{3}$

RATIONAL, REAL

π

irrational, REAL

$\sqrt{4}$

$= 2 \therefore$ rational, real, integers

$\sqrt{2}$

$\approx 1.414\dots$ non-terminating, non-repeating
 $\therefore$ irrational, REAL

42

integer, RATIONAL since $42 = \frac{42}{1}$, REAL

0

integer, RATIONAL $\frac{0}{1}$, REAL $\frac{0}{\text{ANYTHING}} = 0$

$\frac{1}{0}$

undefined, division by 0 is not allowed in the set of real numbers!

$$\frac{\text{ANYTHING}}{0} = \text{undefined}$$

Recall: Algebra is the science of
Reduction AND Reunion.

↓ ↓
taking things apart putting things back together

$$\frac{1}{3} = .\overline{3} \quad \text{by long division}$$

$$.\overline{2} = ? \quad \text{use algebra!}$$

(*) (EX)

$$\text{Let } N = .\overline{2}$$

SINCE THE REPEATING PART
is over one place $\Rightarrow 10^1$
multiply both sides by 10

$$10N = 2.\overline{2}$$

$$-N \quad -.\overline{2}$$

$$\begin{array}{r} 9N = 2 \\ \hline 9 \quad 9 \end{array}$$

SINCE $N = .\overline{2}$ you can
subtract N OR $.\overline{2}$ from
each side WITHOUT
violating the GRE.

Now solve for N

$$\boxed{N = \frac{2}{9}}$$

$$\underline{\underline{\text{CK}}} \quad 9 \overline{) 2.00} \quad \checkmark$$

$$\begin{array}{r} 0.\overline{2} \\ 9 \overline{) 2.00} \\ \underline{18} \\ 20 \end{array}$$

ⓔ Convert $0.\overline{41}$ to a fraction

$$\text{Let } N = .\overline{41}$$

$$100N = 41.\overline{41}$$

$$- N \quad - .\overline{41}$$

$$\begin{array}{r} 99N = 41 \\ \hline 99 \quad 99 \end{array}$$

$$\boxed{N = \frac{41}{99}}$$

⇒ Since the repeating part is over 2 places, multiply by $10^2 = 10 \cdot 10 = 100$

⇒ Use $N = .\overline{41}$

↓ ↓
SUBTRACT FROM LEFT SIDE SUBTRACT REPEATING PART FROM RIGHT SIDE

Does this meet GRE??
Why?

CK: w/ calculator

$$41 \div 99 = .41414141 \checkmark$$

Your turn: Convert $0.0\overline{3}$ to a fraction

$$\text{Let } N = 0.0\overline{3}$$

Multiply by 10

$$10N = 3.333\overline{3}$$

$$- N \quad 0.033\overline{3}$$

LOOK

$$99N = 3.3$$

Since

$$\frac{3.3}{99} \cdot \frac{10}{10} = \frac{33}{990}$$

$$\boxed{N = \frac{3.3}{99} = \frac{33}{990} = \frac{11}{330} = \frac{1}{30}}$$

CK w/ calculator
✓

Homework: Convert to fractions: $.8$, $.2\overline{4}$, $.00\overline{1}$