

RATIONAL NUMBERSCONVERTING RECURRING DECIMAL
TO FRACTION.

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① Find the value of $0.\overline{3} + 0.\overline{6} + 0.\overline{7} + 0.\overline{8}$:

$$a = 2\frac{3}{10}$$

$$b = 2\frac{2}{3}$$

$$c = 2.35$$

$$d = 5\frac{3}{10}$$

— → Bar represents Recurring Decimal

after . digits repetition

$$0.\overline{3} = 0.33333 \dots$$

$$0.\overline{50} = 0.505050 \dots$$

$$1.\overline{03} = 1.030303 \dots$$

$$2.\overline{114} = 2.11444 \dots$$

write 0.3 in $\frac{p}{q}$ form = $\frac{3}{10}$

$$0.3 \neq 0.\overline{3}$$

concept

$$x = 0.\overline{3}$$

$$x = 0.3333 \dots (1)$$

$$10x = 10(0.3333 \dots)$$

$$10x = 3.333 \dots (2)$$

$$1. \quad 0.\overline{a} = \frac{a}{9}$$

$$2. \quad 0.\overline{ab} = \frac{ab}{99}$$

$$3. \quad 0.\overline{abc} = \frac{abc}{999}$$

$$4. \quad 0.a\overline{b} = \frac{ab - a}{90}$$

$$5. \quad 0.\overline{abc} = \frac{abc - a}{990}$$

$$6. \quad ab.\overline{cd} = \frac{abcd - ab}{99}$$

$$\text{eqn (2)} - \text{eqn (1)}$$

$$9x = 3$$

$$x = \frac{3}{9} = \frac{1}{3}$$

(*) Bar → Deno → 9 (priority)

(*) No Bar → 0 (priority 2)

Eg: Method 1 SC. $23.\overline{43} = \frac{2343 - 23}{99} = \frac{2320}{99}$

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A = -
b = 1
C = 76
d = 10

AM
Method 2

$$x = 23.\overline{43}$$

$$x = 23.434343 \dots \quad (1)$$

$$100x = 2343.4343 \dots \quad (2)$$

$$\text{Eqn (2)} - \text{Eqn (1)}$$

$$99x = 2320.000$$

$$x = \frac{2320}{99} //$$

①

Find the value of $0.\overline{3} + 0.\overline{6} + 0.\overline{7} + 0.\overline{8}$

A = $2\frac{3}{10}$

B = $2\frac{2}{3}$

C = 2.35

D = $5\frac{3}{10}$

$$= \frac{3}{9} + \frac{6}{9} + \frac{7}{9} + \frac{8}{9}$$

$$= \frac{24}{9} = \frac{8}{3} \quad (\text{Improper})$$

(*) numerator > denominator

$$= 2\frac{2}{3}$$

$$\begin{array}{r} \text{Q } \frac{R}{D} \quad \frac{D}{3} \bigg) 8 \quad (2 \text{ q}) \\ \underline{6} \\ 2 \text{ R} \end{array}$$

A = 0
b = 0.
C = 0.
d = 0.

②

The difference of $5.\overline{76}$ and $2.\overline{3}$ is:

A 2.54

B $3.\overline{73}$

C $3.\overline{46}$

D $3.\overline{43}$

$$\begin{array}{r} = 5.7676 \dots \\ - 2.3333 \dots \\ \hline 3.4343 \dots \end{array}$$

(-)

③

The simplification of $3.\overline{36} - 2.\overline{05} + 1.\overline{33}$ is

A 2.06

b $2.\overline{61}$

C $2.\overline{64}$

d 2.64

$$\begin{array}{r} 3.3636 \dots \\ - 2.0505 \dots \\ \hline 1.3131 \dots \end{array} \quad \begin{array}{r} + 1.3131 \dots \\ + 1.3333 \dots \\ \hline 2.6464 \dots \end{array}$$

④ Simplify $(0.\overline{1})^2 [1 - 9(0.\overline{16})^2] =$ _____

$A = -1/162$

$b = 1/108$

$C = 7696/10^9$

$d = 106$

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$$= \left(\frac{1}{9}\right)^2 \left[1 - 9 \left(\frac{16-1}{90}\right)^2\right]$$

$$= \frac{1}{81} \left[1 - 9 \times \left(\frac{15}{90}\right)^2\right]$$

$$= \frac{1}{81} \left[1 - 9 \times \left(\frac{1}{6}\right)^2\right] = \frac{1}{81} \left[1 - 9 \times \frac{1}{36}\right]$$

$$= \frac{1}{81} \left[1 - \frac{1}{4}\right]$$

$$= \frac{1}{81} \left[\frac{3}{4}\right]$$

$$= \frac{1}{27 \times 4} = \frac{1}{108} //$$

⑤ Find the cube root of $0.\overline{037}$:

$A = 0.\overline{3}$

$b = 0.\overline{13}$

$C = 0.\overline{23}$

$d = 0.\overline{23}$

$$0.\overline{037} = \frac{37}{999} = \frac{37}{9 \times 111} = \frac{37}{9 \times 3 \times 37}$$

$$= \frac{1}{9 \times 3} = \frac{1}{27} //$$

$$\sqrt[3]{\frac{1}{27}}$$

$$3 \times 3 \times 3 = 27 //$$

$$0.3 \times 0.3 \times 0.3 = 0.27 //$$

=

⑥

If $0.a\bar{b} + 0.b\bar{a} = 7/9$, then how many pairs are possible for (a, b) ?

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$A = 5$

$b = 4$

$c = 3$

$D = 1$

$0.a\bar{b} + 0.b\bar{a} = 7/9$

$a = \left\{ \begin{array}{l} \text{digits} \\ b = \end{array} \right.$

2 digit no.

$\frac{ab - a}{90} + \frac{ba - b}{90} = \frac{7}{9}$

$\frac{10a + b - a}{90} + \frac{10b + a - b}{90} = \frac{7}{9}$

eg: $a = 2$
 $b = 3$

$ab = 23$

$\frac{10a + \cancel{b} - \cancel{a} + 10b + \cancel{a} - \cancel{b}}{90} = \frac{7}{9}$

tens $\times 10$ units $\times 1$

$= 10a + b \times 1$

$= 2 \times 10 + 3 \times 1$

$= 23$

$\frac{10a + 10b}{90} = \frac{7}{9}$

$\frac{10(a+b)}{10} = 7$

$x y z$

$100x + 10y + z$

$a + b = 7$

a, b

$1, 6 \checkmark$

$2, 5$

$3, 4$

$a + b = 7 \checkmark$

$1 + 6 = 7$

$2 + 5 = 7$

$3 + 4 = 7$

$4 + 3 = 7$

3 pairs

(7) Find the value of $0.\overline{57} - 0.\overline{432} + 0.\overline{35}$

$$a = 0.\overline{494}$$

$$b = 0.\overline{497}$$

$$c = 0.\overline{498}$$

$$d = 0.\overline{498}$$

$$0.575757$$

$$0.43232$$

$$0.143437$$

$$+ 0.355555$$

$$498992$$

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Denominator $\left\{ \begin{array}{l} 9 \text{ (Base 20)} \\ 0 \text{ (Base 20)} \end{array} \right\} \rightarrow$

$\frac{P}{Q}$ form questions