

GAYAZA HIGH SCHOOL

S.4 MATH WORKSHEET ONE

Converting Repeating Decimals to Fractions

Example 1: Convert 0.555... to a fraction.

The x be the refraction

Let $x = 0.555\dots$

Then $10x = 5.555\dots$

Subtract: $10x = 5.5$

$$\begin{array}{r} -x = 0.5555\dots \\ 10x = 5.5555\dots \\ \hline 9x = 5 \end{array}$$

Note: $x = 1x$

Solve for x: $\frac{9x}{9} = \frac{5}{9}$

Dividing both sides of the equation by 9

$x = \frac{5}{9}$

Step 1: Set $x =$ repeating decimal.**Step 2:** Get repeater next to the decimal by multiplying both sides of the equation by a multiple of 10.**Step 3:** Find a second equation with the same repeater next to the decimal. Again, do this by multiplying both sides of the equation by another multiple of 10.**Step 4:** Subtract **Step 2** from **Step 3****Step 5:** Solve for x.**Step 6:** Simplify**Example 2: (UNEB 2018 P2 NO. 1)****Express the recurring decimal 1.633... in the form $\frac{a}{b}$ where a and b are integers.**

The x be the refraction

(1) Let $x = 1.633\dots$

(2) Then $10x = 16.33\dots$

Both sides of the equation are multiplied by 10 so that the repeating part of the number is immediately next to the decimal.

(3) Then $100x = 163.33\dots$

Here, both sides of the (original) equation are multiplied by 100 so that the SAME repeating part of the number is immediately next to the decimal.

(4) Subtract: $100x = 163.33\dots$

$$\begin{array}{r} 100x = 163.33\dots \\ -10x = 16.33\dots \\ \hline 90x = 147 \end{array}$$

Subtract step 2 from step 3. Note how the repeating decimal drops out of the equation and the coefficients (leading numbers) are both whole numbers. Beautiful!

(5) Solve for x: $\frac{90x}{90} = \frac{147}{90}$

Divide both sides of the equation by the same value--in this case, 90.

(6) Simplify: $x = \frac{147}{90} = \frac{49}{30}$

Final answer: $1.633... = \frac{49}{30}$ where $a = 49$ and $b = 30$

Example 3: Convert 2.13535... to a fraction.

The x be the refracton

(1) Let $x = 2.13535...$

(2) Then $10x = 21.3535...$

Both sides of the equation are multiplied by 10 so that the repeating part of the number is immediately next to the decimal.

(3) Then $1000x = 2135.3535...$

Here, both sides of the (original) equation are multiplied by 1000 so that the SAME repeating part of the number is immediately next to the decimal.

(4) Subtract: $1000x = 2135.3535...$

$- \quad 10x = \quad 21.3535...$

$990x = 2114$

Subtract step 2 from step 3. Note how the repeating decimal drops out of the equation and the coefficients (leading numbers) are both whole numbers. Beautiful!

(5) Solve for x: $\frac{990x}{990} = \frac{2114}{990}$

Divide both sides of the equation by the same value--in this case, 990.

(6) Simplify: $x = \frac{2114}{990} = \frac{1057}{495} = 2 \frac{67}{495}$

Final answer: $2.13535... = 2 \frac{67}{495}$

1. Express each infinitely repeating decimal as a rational number (fraction)

4 marks @

(a) 0.4888...	(b) 0.3838...
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(c) 2.4343...	(d) 0.3131...
(e) 2.4343...	(f) 0.0729729...

2. Express $0.341666\dots$ in the form $\frac{p}{q}$, where $q \neq 0$ (4 marks)

3. Express $2.10303\dots$ in the form $2\frac{a}{b}$, where a and b are integers. (4 marks)

4. Convert $5.272727\dots$ to a fraction. (4 marks)