Name: ..... Date .....

GAYAZA HIGH SCHOOL

S.2 MATH WORKSHEET ONE

Converting Repeating Decimals to Fractions

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

The x be the refraction

Let $x = 0.555...$

Then $10x = 5.555...$

Subtract: $10x = 5.5$

$$\underline{\quad -x = 0.5555... \quad}$$

$$9x = 5$$

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 $x = 1.633...$

(2) Then $10x = 16.33...$

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 $100x = 163.33...$

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: $100x = 163.33...$

$$\underline{- 10x = \quad 16.33...}$$

$$90x = 147$$

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: $1.633\ldots = \frac{49}{30}$ $where\ a = 49\ and\ b = 30$

Example 3: Convert 2.13535… to a fraction.

The x be the refraction

(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…

\- 10x = 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: $2.13535\ldots = 2\frac{67}{495}$

1. Express each infinitely repeating decimal as a rational number (fraction) **4 marks @**

(a) 0.4888…	(b) 0.3838…

(c) 2.4343…	(d) 0.3131…
(e) 2.4343…	(f) 0.0729729…

2. Express 0.341666… in the form $^{p}/_{q}$, where $q \neq 0$ (4 marks)

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

4. Convert 5.272727… to a fraction. (4 marks)
