Name _____ Period_____ Date_____

Writing a Repeating Decimal as a Fraction (2-digit repeats) #2

Example A: To write $0.\overline{25}$ as a fraction, let $x = 0.\overline{25}$

1. Notice that only *two digits are repeating*. Multiply both sides of the equation by 100. Then $100x = 25.\overline{25}$ or $25.2525\ldots$

2. Subtract x from $10x$.

$$100x = 25.2525\ldots$$
$$-\quad x = 0.2525\ldots$$
$$99x = 25.0000$$

3. Solve for x and simplify.

$$\frac{99x}{99} = \frac{25.0000}{99}$$
$$x = \frac{25}{99}$$

$\frac{25}{99}$ is the equivalent fraction for $0.\overline{25}$

Write each decimal as a fraction.

1. $0.\overline{23}$

2. $-0.\overline{50}$

3. $3.\overline{81}$

4. $5.1212\ldots$

5. $1.303030\ldots$

Example B: To write $0.0\overline{53}$ as a fraction, let $x = 0.0\overline{53}$

1. Notice that only *two digits are repeating*. Multiply both sides of the equation by 100. Then $100x = 5.3\overline{53}$ or $5.35353\ldots$

2. Subtract x from $10x$.

$$100x = 5.35353\ldots$$
$$-\quad x = 0.05353\ldots$$
$$99x = 5.30000$$

3. Solve for x and simplify.

$$\frac{99x}{99} = \frac{5.30000}{99}$$
$$x = \frac{5.3}{99}, \quad so \quad \frac{5.3}{99} = \frac{53}{990}$$

$\frac{53}{990}$ is the equivalent fraction for $0.0\overline{53}$

Write each decimal as a fraction.

1. $0.0\overline{37}$

2. $-.3\overline{54}$

3. $2.9\overline{31}$