Name _____
Date _____ Per_____ A#_____

Repeating Decimals

How to write repeating decimals

We draw a line above decimal digits when they repeat over and over again.

For example: $0.\overline{3}$ is the same as 0.33333333333333... (and so on)

$0.\overline{25}$ is the same as 0.25252525252525... (and so on)

$0.12\overline{34}$ is the same as 0.123434343434... (and so on)

1. Use a calculator to change these fractions into decimals. Try to use the notation described above.

$\frac{2}{3} = 0.\overline{6}$ $\frac{3}{11} = 0.\overline{27}$ $\frac{5}{6} = 0.8\overline{3}$ $\frac{50}{99} = 0.\overline{50}$

2. Follow along with your teacher to show how to convert a repeating decimal into a fraction.

Let $x = 0.\overline{45}$

$100x = 45.\overline{45}$

$-\ x = 0.\overline{45}$

$99x = 45$

$\frac{99x}{99} = \frac{45}{99}$

$x = \frac{45 \div 9}{99 \div 9} = \boxed{\frac{5}{11}}$

Let $x = 0.1\overline{6}$

$10x = 1.\overline{6}$

$-\ x = -.1\overline{6}$

$9x = 1.5$

$\frac{9x}{9} = \frac{1.5}{9}$

$x = \frac{1.5}{9}\left(\frac{10}{10}\right) = \frac{15 \div 15}{90 \div 15} = \boxed{\frac{1}{6}}$

3. Change each of these ~~decimals~~ into fractions. Show all work.

★ 0.54	$0.\overline{3}$	$0.\overline{54}$
$0.5\overline{4}$	$0.\overline{72}$	$0.41\overline{6}$