Name ______________________________ Date ______________

Rational and Irrational Decimals

Natural Numbers and Decimals

Decimals that are **rational numbers** can be turned into either repeating or terminating decimals.

- 0.5 and 0.25 are terminating decimals.
- $0.\overline{3}$, $0.1\overline{6}$, and $0.\overline{142857}$ are repeating decimals with a pattern that never ends.

Decimals that are **irrational numbers** go beyond the point that we can calculate them.

- $\sqrt{7} = 2.6457513110645905016157536392604257102591830824501803 68 \ldots$
- $\pi = 3.14159265358979323846264338327950288419716939937510582097 \ldots$

Translate each fraction or square root into a decimal. Write each fraction from the fraction box beneath the appropriate heading. Find the irrational numbers and write them under the appropriate heading.

Fraction Box

$\frac{1}{2}$	$\frac{1}{3}$	$\sqrt{9}$	$\frac{1}{4}$	$\frac{1}{5}$	$\sqrt{25}$	$\frac{1}{6}$	$\frac{1}{7}$	π	$\frac{1}{8}$	$\frac{1}{9}$	$\frac{1}{10}$	$\sqrt{2}$	$\frac{2}{3}$	$\frac{3}{4}$	$\frac{2}{5}$
$\frac{5}{6}$	$\sqrt{5}$	$\frac{2}{7}$	$\frac{5}{7}$	$\sqrt{3}$	$\frac{3}{8}$	$\frac{2}{9}$	$\sqrt{6}$	$\frac{7}{9}$	$\frac{3}{10}$	$\sqrt{4}$	$\frac{3}{5}$	$\frac{6}{7}$	$\frac{5}{8}$	$\frac{4}{9}$	$\frac{8}{9}$

Terminating	Repeating

Irrational

Did you know? The philosopher Hippasus used geometric methods to prove that $\sqrt{2}$ is irrational. This so irritated the other mathematical philosophers that they threw him overboard. How's that for irrational?