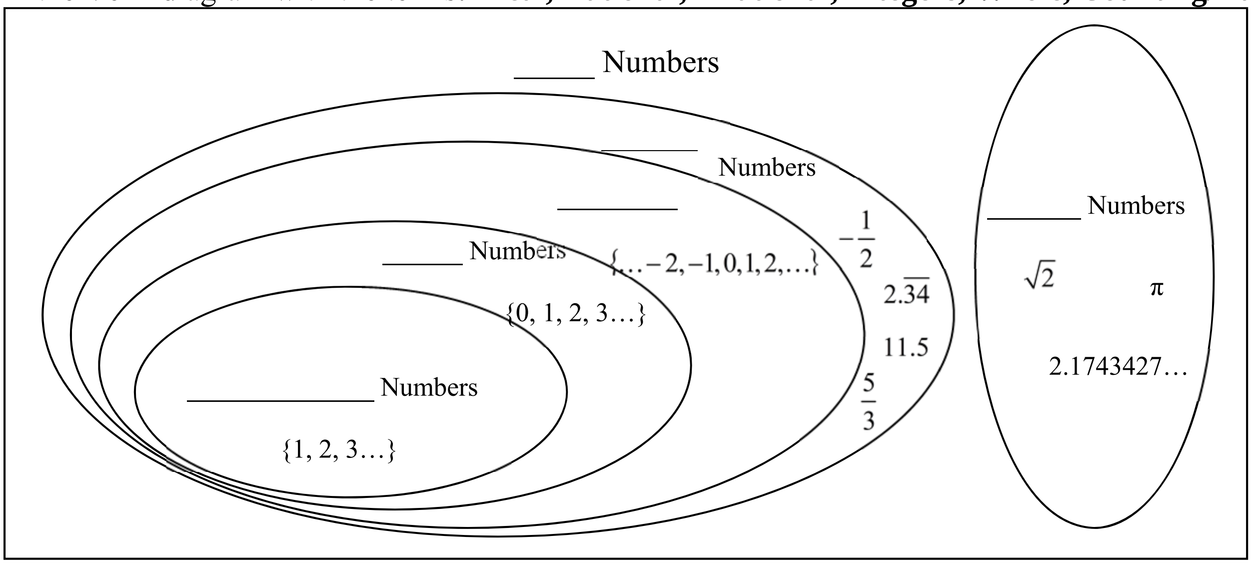
Name ________________________________ Period_________ Date_______________

Classifying Real Numbers (page 1)

The set of **real numbers** consists of all rational and irrational numbers. This relationship can be shown in a Venn diagram. A **rational number** is a number that can be written as a quotient of two integers. The decimal form repeats or terminates. An **irrational number** is a number that cannot be written as a quotient of two integers. The decimal form neither terminates nor repeats.

Fill in the Venn diagram with the terms**: Real, Rational, Irrational, Integers, Whole, Counting/Natural**.



A. Classify each real number. Give your reasoning.

Number	Subset(s)	Reasoning
$\frac{10}{2}$	Natural, Whole, Integer, Rational	$\frac{10}{2}=5$
$-\sqrt{16}$	Integer, Rational	$-\sqrt{16}=-4$
$0.\overline{35}$	Rational	Repeating decimal
$\sqrt{14}$	Irrational	14 not a perfect square; decimal does not repeat or terminate
π	Irrational	Decimal form does not repeat or terminate
$\sqrt[3]{5}$	Irrational	5 not a perfect cube; decimal does not repeat or terminate

B. Which number is greater, $\sqrt{5}$ *or* $2\frac{2}{3}$? Explain.

$2<\sqrt{5}<3,\ so\ \sqrt{5}\approx 2.?$

$\left.\begin{matrix}\left.\begin{matrix}\sqrt{4}\\ \sqrt{5}\end{matrix}\right\}1\\ \sqrt{9}\end{matrix}\right\}5,\ \frac{1}{5}=.2$

And $2\frac{2}{3}\approx 2.\overline{6}$ So

$2.\overline{6}>2.2\ so$

$2\frac{2}{3}>\sqrt{5};$ $2\frac{2}{3}$ *is greater.*

So $\sqrt{5}\approx 2.2$

Classifying Real Numbers (page 1)

1. Classify each real number. Give your reasoning.

Number	Subset(s)	Reasoning
$\sqrt[3]{27}$		
$-\sqrt{144}$		
π		
$\frac{21}{2}$		
$\sqrt{18}$		
$0.\overline{123}$		

2. (SBAC) A student claims: " If a rational number is not an integer, then the square root of the number must be irrational. For example, $\sqrt{2.5}$ is irrational and so is $\sqrt{\frac{2}{5}}$ irrational." Show an example of a rational number that is not an integer to show that this claim in incorrect!