

Topic

Sets of Numbers

THE REAL NUMBER SYSTEM

<p>Rational any number that can be written as $\frac{a}{b}$</p> <p>Integers (all whole numbers and their opposites)</p> <p>Whole (natural #'s + 0)</p> <p>Natural (counting) 1, 2, 3, 4, ...</p>	<p>Irrational any number that goes on and on without a pattern.</p> <p>$\pi = 3.14\dots$</p>
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$-\frac{3}{4}, .2, .76, -.3, \sqrt{9}, \sqrt{25}, .33, .0124$

$\sqrt{7}$

* opposite - Two numbers that are the same distance from zero but on opposite sides of the number line

$5 = \frac{5}{1}$
 $74 = \frac{74}{1}$

$.2 = \frac{2}{10} = \frac{1}{5}$
 $.35 = \frac{35}{100} = \frac{7}{20}$

$\sqrt{9} = 3 = \frac{3}{1}$
 $-24 = \frac{-24}{1}$

Not what remember

For each of the following lists of numbers determine which are included in the given sets.

1) Whole Numbers

$\sqrt{2}$, $\frac{1}{4}$, 7 , -2 , 0 , 1 , 4.567 , 2 million

2) Irrational Numbers

$\frac{1}{4}$, -3 , 0 , $\sqrt{7}$, $.3333$, 1984 , $\sqrt{4}$, $3.1415\dots$ $\{\sqrt{7}, 3.1415\dots\}$

3) Real Numbers

$.22222$, 9 , -4 , π , 0 , $\sqrt{2}$, 800 , $\frac{3}{4}$ $\{$

4) Integers

8 , -125 , $\sqrt{16}$, $.825$, -2 , 0 , $\sqrt{3}$

5) Rational Numbers

$.75$, -9 , 0 , $\sqrt{4/6}$, $\frac{3}{4}$, $-\frac{1}{4}$, $\sqrt{7}$, $.232323$

The set of natural numbers is $\{1, 2, 3, \dots\}$

The members of a set are called its **elements**.

Ways to write a set:

$\{ \text{elements} \}$

Roster Form - Members of a set are listed such as $\{1, 2, 3, \dots\}$ or $\{3, 5\}$

list

Set Builder Notation - Members of a set are described but not listed $\{x \mid x \text{ is a natural number less than } 5\}$

such that

read this as

$\{1, 2, 3, 4\}$

The set of all x such that x is a natural number less than 5.