

Basic Properties of Sets

MATH 1001

Quantitative Skills and Reasoning



COLUMBUS STATE
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Sets

- Any group or collection of objects is called a **set**. The objects that belong in a set are the **elements**, or **members**, of the set.
- We will begin by using two methods of designating a set:
 - Describe the set using words.
 - List the elements of the set inside a pair of braces, $\{ \}$. This method is called the **roster method**. Commas are used to separate the elements. Ellipses (...) indicate that the elements of the set continue in a manner suggested by the listed elements. Order *does not* matter.

Sets

- Some examples:

Description	Roster Method
The set of days of the week	{Sunday, Monday, Tuesday, Wednesday, Thursday, Friday, Saturday}
The set of U.S. coin currency worth less than \$0.50	{pennies, nickels, dimes, quarters}
The set of states in the U.S. that border the Gulf of Mexico	{Florida, Alabama, Mississippi, Louisiana, Texas}

Sets

- Complete the table:

Description	Roster Method
The set of the months in a year	{January, February, March, April, May, June, July, August, September, October, November, December}
The set of the even counting numbers	{2, 4, 6, 8, 10, ...}

Sets

- Basic Number Sets:

Description	Roster Method
Natural Numbers or Counting Numbers	\mathbb{N} $N = \{1, 2, 3, 4, 5, \dots\}$
Whole Numbers	\mathbb{W} $W = \{0, 1, 2, 3, 4, 5, \dots\}$
Integers	\mathbb{Z} $Z = \{\dots, -4, -3, -2, -1, 0, 1, 2, 3, 4, \dots\}$
Rational Numbers	\mathbb{Q} $Q =$ the set of all terminating or repeating decimals
Irrational Numbers	\mathbb{I} $I =$ the set of all nonterminating, nonrepeating decimals
Real Numbers	\mathbb{R} $R =$ the set of all rational or irrational numbers <small>π, e, \dots</small>

Sets

Description	Roster Method
Natural Numbers or Counting Numbers	$N = \{1, 2, 3, 4, 5, \dots\}$
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Real Numbers	R = the set of all rational or irrational numbers

- Use the roster method to write each of the given sets:
 - The set of whole numbers less than 7. $\{0, 1, 2, 3, 4, 5, 6\}$
 - The solution set of $x + 5 = -2$ $\{-7\}$
 - The set of negative integers greater than -6. $\{-5, -4, -3, -2, -1\}$