

Algebra 1
Classifying Real Numbers

Classifying Real Numbers | A1-U01-P01

96 problems · Four activity formats

01	Answer Bank Challenge	24 tasks
02	Grid Rounds	24 tasks
03	Match & Move	24 cards
04	Error Analysis & Strategy	24 tasks
05	Quick Answer Key	96 answers
06	Full Worked Solutions	96 solutions
07	Teacher / Parent Use Guide	included
08	Terms of Use & License	included

Topic focus
Across 96 tasks this topic asks for classification with justification.
8 PDFs and a README; 48 buyer pages.

Algebra 1

Classifying Real Numbers

Name: _____ Date: _____ Class: _____

Answer each question and record the matching bank letter. Give exact values. Give the whole requested response, including any reasoning the question asks for.

Use $N = \{1, 2, 3, \dots\}$, $W = \{0, 1, 2, \dots\}$, Z for integers, Q for rational numbers, and R for real numbers. For the exact value $\sqrt{11}$, name the smallest set it belongs to and then list every containing set among N, W, Z, Q, and R. _____ Bank label: _____	Use $N = \{1, 2, 3, \dots\}$, $W = \{0, 1, 2, \dots\}$, Z for integers, Q for rational numbers, and R for real numbers. For the exact value $(2 - \sqrt{5})(2 + \sqrt{5})$, name the smallest set it belongs to and then list every containing set among N, W, Z, Q, and R. _____ Bank label: _____
Determine whether the number is rational, irrational, or not determined by the evidence. Justify your decision: 1.08333...; after 08, the digit 3 repeats forever. _____ Bank label: _____	Use $N = \{1, 2, 3, \dots\}$, $W = \{0, 1, 2, \dots\}$, Z for integers, Q for rational numbers, and R for real numbers. For the exact value $\frac{0.125}{0.5}$, name the smallest set it belongs to and then list every containing set among N, W, Z, Q, and R. _____ Bank label: _____
Determine whether the number is rational, irrational, or not determined by the evidence. Justify your decision: $0.d_1d_2d_3\dots$ where $d_n = 3$ when n is a power of 2 and 0 otherwise. _____ Bank label: _____	Use $N = \{1, 2, 3, \dots\}$, $W = \{0, 1, 2, \dots\}$, Z for integers, Q for rational numbers, and R for real numbers. For the exact value $\frac{\sqrt{12}}{\sqrt{3}}$, name the smallest set it belongs to and then list every containing set among N, W, Z, Q, and R. _____ Bank label: _____
Determine whether the number is rational, irrational, or not determined by the evidence. Justify your decision: 0.314159...; only these six digits are supplied and no continuation rule is given. _____ Bank label: _____	Use $N = \{1, 2, 3, \dots\}$, $W = \{0, 1, 2, \dots\}$, Z for integers, Q for rational numbers, and R for real numbers. For the exact value $\sqrt{0}$, name the smallest set it belongs to and then list every containing set among N, W, Z, Q, and R. _____ Bank label: _____

Algebra 1

Classifying Real Numbers

Name: _____ Date: _____ Class: _____

Answer each question and show your reasoning in the workspace. Give exact values rather than decimals unless the question supplies a decimal. Give the whole requested response, including any reasoning the question asks for.

Determine whether the number is rational, irrational, or not determined by the evidence. Justify your decision: 13.6 is exact and terminating. 	Use $N = \{1, 2, 3, \dots\}$, $W = \{0, 1, 2, \dots\}$, Z for integers, Q for rational numbers, and R for real numbers. For the exact value -2.75, name the smallest set it belongs to and then list every containing set among N, W, Z, Q, and R.
Determine whether the number is rational, irrational, or not determined by the evidence. Justify your decision: 4.000 is exact. 	Use $N = \{1, 2, 3, \dots\}$, $W = \{0, 1, 2, \dots\}$, Z for integers, Q for rational numbers, and R for real numbers. For the exact value $-\frac{4}{1}$, name the smallest set it belongs to and then list every containing set among N, W, Z, Q, and R.
Determine whether the number is rational, irrational, or not determined by the evidence. Justify your decision: $0.d_1d_2d_3\dots$ where $d_n = 1$ when n is a perfect square and 0 otherwise. 	Use $N = \{1, 2, 3, \dots\}$, $W = \{0, 1, 2, \dots\}$, Z for integers, Q for rational numbers, and R for real numbers. For the exact value $1 - \sqrt{2}$, name the smallest set it belongs to and then list every containing set among N, W, Z, Q, and R.

Algebra 1

Classifying Real Numbers

Name: _____ Date: _____ Class: _____

Evaluate the supplied statement or method. Say whether it is correct, repair it if it is not, and verify the result exactly. Not every prompt contains an error.

A student gives this classification argument: (1) $\sqrt{36}$ contains a radical sign. (2) Every radical is irrational. (3) Therefore $\sqrt{36}$ is irrational. Identify the first invalid claim and repair it, or state that the argument is correct.

A student gives this classification argument: (1) 0.333... repeats forever. (2) A nonterminating decimal is irrational. (3) Therefore 0.333... is irrational. Identify the first invalid claim and repair it, or state that the argument is correct.

A student gives this classification argument: (1) $\frac{7}{2}$ is a ratio of integers. (2) Its denominator is nonzero. (3) Therefore it is rational but not an integer. Identify the first invalid claim and repair it, or state that the argument is correct.

A student gives this classification argument: (1) If x is irrational, then x is real. (2) If x is real, then x is irrational. (3) Thus every real number is irrational. Identify the first invalid claim and repair it, or state that the argument is correct.

Classifying Real Numbers

Full Worked Solutions - excerpt

Worked example

Problem. Use $N = \{1, 2, 3, \dots\}$, $W = \{0, 1, 2, \dots\}$, Z for integers, Q for rational numbers, and R for real numbers. For the exact value $\sqrt{11}$, name the smallest set it belongs to and then list every containing set among N, W, Z, Q , and R .

Answer. irrational; also R

Explanation and check.

Eleven is not a perfect square, so $\sqrt{11}$ is irrational and real.

Worked example

Problem. Use $N = \{1, 2, 3, \dots\}$, $W = \{0, 1, 2, \dots\}$, Z for integers, Q for rational numbers, and R for real numbers. For the exact value $(2 - \sqrt{5})(2 + \sqrt{5})$, name the smallest set it belongs to and then list every containing set among N, W, Z, Q , and R .

Answer. Z ; also Q, R

Explanation and check.

The conjugate product is

$$4 - 5 = -1$$

an integer.