Name _____ Date _____

Real Numbers: Always, Sometimes, Never

Determine whether each statement is always true, sometimes true, or never true. Then, circle your answer and explain your thinking on the lines below. Think about the definitions for each type of number and try to come up with examples that are true and examples that are false to help you!

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1. A whole number is a rational number.

(always true)   sometimes true   never true

All whole numbers can be written as a fraction with a denominator of 1, so a whole number is always a rational number.

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2. An irrational number can be written as a proper fraction.

always true   sometimes true   **(never true)**

An irrational number is never rational, so it is impossible to write an irrational number as a proper fraction.

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3. The decimal form of a rational number terminates.

always true   **(sometimes true)**   never true

The decimal form of some rational numbers terminates, like $\frac{2}{5} = 0.4$. The decimal form of other rational numbers repeats, like $\frac{1}{3} = 0.\overline{3}$.

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4. A real number that is not rational is irrational.

(always true)   sometimes true   never true

A real number must either be rational or irrational. This means that if a real number is not rational, it will always be irrational.

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5. A negative number is a rational number.

always true   **(sometimes true)**   never true

Some negative numbers, like –3, are rational. Other negative numbers, like $-\sqrt{3}$, are irrational.

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6. The square root of a natural number is irrational.

always true   **(sometimes true)**   never true

The square root of some natural numbers is irrational, like $\sqrt{2}$. The square root of other natural numbers is rational, like $\sqrt{4}$.

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7. A rational number is irrational.

always true   sometimes true   **(never true)**

A rational number is never irrational. A number must be one or the other, depending on whether it can be written as a proper fraction.

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8. A rational number is an integer.

always true   **(sometimes true)**   never true

Some rational numbers are integers, like 5. Other rational numbers are not integers, like 5.12.