# Rational and Irrational Numbers

| Name: _____ | Date: _____ | Score: _____ / 18 |
|---|---|---|

## Quick Review and Helpful Hints

A *rational* number can be written as a fraction of integers; its decimal *terminates or repeats*. An *irrational* number cannot – its decimal runs forever without repeating (like $\pi$, or $\sqrt{n}$ when $n$ is not a perfect square).

▷ **Example:** Is $\sqrt{9}$ rational or irrational? **Work:** $\sqrt{9} = 3$, a whole number, which is a fraction $\frac{3}{1}$. ★ **Answer:** Rational


Rational | Irrational.

## Practice Problems

*Tell whether each number is Rational or Irrational.*

1. $\sqrt{9}$ _____
2. $\sqrt{2}$ _____
3. $0.5$ _____
4. $\pi$ _____
5. $\frac{1}{3}$ _____
6. $\sqrt{16}$ _____
7. $\sqrt{7}$ _____
8. $0.\overline{3}$ (repeating) _____
9. $\sqrt{25}$ _____
10. $\sqrt{10}$ _____
11. $4$ _____
12. $-\frac{2}{5}$ _____
13. $\sqrt{100}$ _____
14. $0.1010010001\ldots$ _____

## Word Problems

15. Is $\sqrt{4}$ rational or irrational? _____
16. Is $\pi$ rational or irrational? _____
17. Is $7$ a rational number? _____
18. Is $\sqrt{3}$ rational or irrational? _____



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# Answer Keys

| | | |
|---|---|---|
| **1.** Rational | **7.** Irrational | **13.** Rational |
| **2.** Irrational | **8.** Rational | **14.** Irrational |
| **3.** Rational | **9.** Rational | **15.** Rational |
| **4.** Irrational | **10.** Irrational | **16.** Irrational |
| **5.** Rational | **11.** Rational | **17.** Yes |
| **6.** Rational | **12.** Rational | **18.** Irrational |

## Step-by-Step Explanations

**1.** Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is $\sqrt{9} = 3$: rational. So the final answer is Rational.

**2.** A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is $2$ is not a perfect square: irrational. So the final answer is Irrational.

**3.** Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is It terminates: rational. So the final answer is Rational.

**4.** Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is $\pi$ never repeats: irrational. So the final answer is Irrational.

**5.** Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is A fraction of integers: rational. So the final answer is Rational.

**6.** A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is $\sqrt{16} = 4$: rational. So the final answer is Rational.

**7.** Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is $7$ is not a perfect square: irrational. So the final answer is Irrational.

**8.** Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is A repeating decimal: rational. So the final answer is Rational.

**9.** Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is $\sqrt{25} = 5$: rational. So the final answer is Rational.

**10.** A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is $10$ is not a perfect square: irrational. So the final answer is Irrational.

**11.** Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is A whole number $= \frac{4}{1}$: rational. So the final answer is Rational.

**12.** Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is A fraction of integers: rational. So the final answer is Rational.

**13.** Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is $\sqrt{100} = 10$: rational. So the final answer is Rational.

**14.** A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is Non-repeating, non-terminating: irrational. So the final answer is Irrational.

**15.** Step by step: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is $\sqrt{4} = 2$: rational. So the final answer is Rational.

**16.** Take it one move at a time: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is $\pi$ is irrational. So the final answer is Irrational.

**17.** Start by naming the process: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is $7 = \frac{7}{1}$, so yes. So the final answer is Yes.

**18.** A good way to think about this is: Read what the problem is asking, choose the matching rule, write the setup, and then simplify one step at a time. The setup/work is $3$ is not a perfect square: irrational. So the final answer is Irrational.

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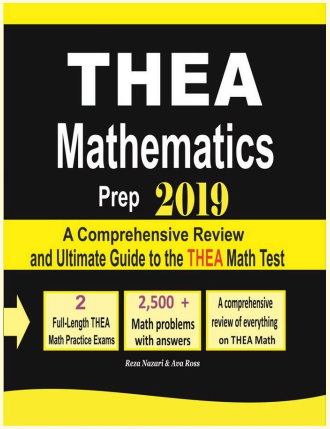


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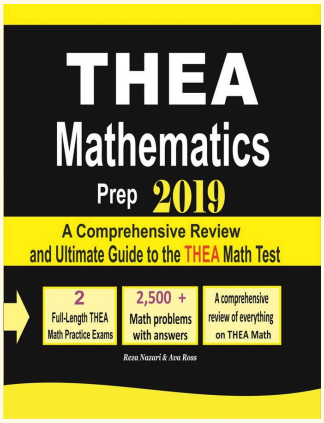


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