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 π, 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. π _____
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 π 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 π 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 π 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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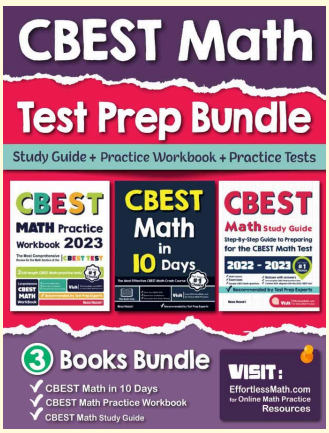

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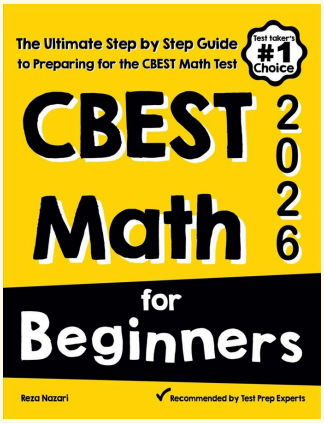

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