

Grade 8 · Rational and Irrational Numbers · Quiz

Common Core 8.NS.A.1, 8.NS.A.2 · mathovore.fr

Name: _____ Date: ____/____/____ Score: _____

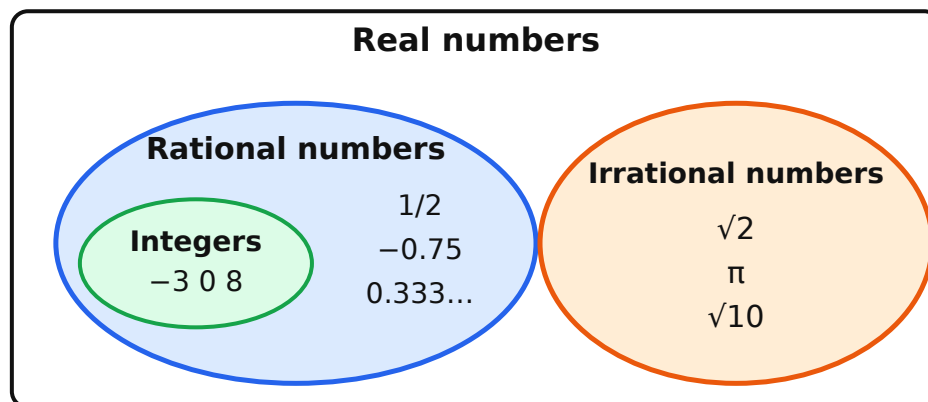
This 10-question quiz checks rational and irrational numbers for Grade 8: classifying numbers, converting repeating decimals, estimating square roots and comparing. Choose the one correct answer for each question, then read the explanation.

Grade 8 Common Core: 8.NS.A.1 · 8.NS.A.2

Questions

Question 1

Which of these numbers is irrational?



Rational and irrational numbers.

- A. $\sqrt{16}$
- B. $\sqrt{17}$
- C. $0.\overline{27}$
- D. $-\frac{9}{4}$

Question 2

What is $\frac{3}{11}$ as a decimal?

- A. 0.27
- B. $0.\overline{3}$
- C. $0.\overline{27}$

D. $0.\overline{2727}$

Question 3

Which fraction equals $0.\overline{6}$?

- A. $\frac{3}{10}$
- B. $\frac{1}{10}$
- C. $\frac{6}{10}$
- D. $\frac{6}{100}$

Question 4

Which fraction equals $0.\overline{35}$?

- A. $\frac{35}{100}$
- B. $\frac{35}{99}$
- C. $\frac{35}{90}$
- D. $\frac{35}{999}$

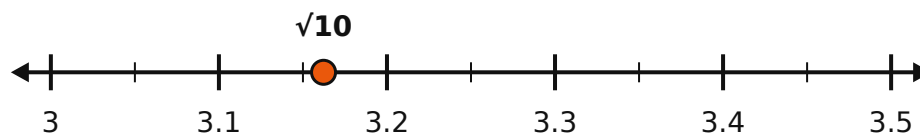
Question 5

Between which two integers is $\sqrt{45}$?

- A. 5 and 6
- B. 7 and 8
- C. 22 and 23
- D. 6 and 7

Question 6

What is $\sqrt{10}$ to the nearest tenth?



The root of 10 is near 3.16.

- A. 3.1
- B. 3.3
- C. 3.2
- D. 3.0

Question 7

Which number is the greatest?

- A. 2.8

- B. $2.\overline{7}$
- C. $\frac{11}{4}$
- D. $\sqrt{8}$

Question 8

Which rational number is between $\sqrt{3}$ and $\sqrt{5}$?

- A. 1.7
- B. 2.3
- C. 1.5
- D. 2.1

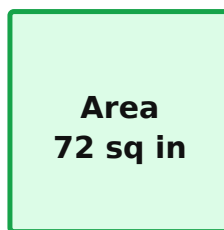
Question 9

Which statement about irrational numbers is true?

- A. Their decimal form never ends and never repeats.
- B. Their decimal form always ends after a few digits.
- C. Every decimal that never ends is irrational.
- D. They can be written as a fraction of integers.

Question 10

A square floor tile has an area of 72 square inches. About how long is each side?



side = ?
The tile.

- A. 8.5 in
- B. 36 in
- C. 8 in
- D. 9 in

Answer key

1. **B** - 17 is not a perfect square, so $\sqrt{17}$ never ends or repeats. $\sqrt{16} = 4$ is an integer, and the other two are fractions or repeating decimals.
2. **C** - Dividing 3 by 11 gives the block 27 repeating forever. Stopping at 0.27 or 0.2727 treats a repeating decimal as terminating.
3. **C** - Let $x = 0.666\dots$. Then $10x - x = 6$, so $9x = 6$ and $x = 2/3$. The fraction $3/5$ is 0.6, which terminates.
4. **B** - Two digits repeat, so multiply by 100 and subtract: $99x = 35$. A denominator of 100 or 999 would match a different number of digits.
5. **D** - $6^2 = 36$ and $7^2 = 49$, and 45 is between them. Dividing 45 by 2 and rounding gives the common error 22 and 23.
6. **C** - $3.1^2 = 9.61$ and $3.2^2 = 10.24$. Since $\sqrt{10} \approx 3.162$, the nearest tenth is 3.2, not the truncated 3.1.
7. **D** - $\sqrt{8} \approx 2.83$, which is larger than 2.8, 2.78 and 2.75. Comparing digits without finding the decimal for the root causes the mistake of picking 2.8.
8. **D** - $\sqrt{3} \approx 1.73$ and $\sqrt{5} \approx 2.24$. Only 2.1 lies between them; 1.7 and 1.5 are too small and 2.3 is too big.
9. **A** - An irrational number has a non-ending, non-repeating decimal. A non-ending decimal that repeats, such as $0.333\dots$, is rational.
10. **A** - $8.5^2 = 72.25$, which is very close to 72. Halving the area gives 36, and rounding to a whole number gives 8 or 9.

Remember:

- Standards 8.NS.A.1 and 8.NS.A.2: tell rational from irrational numbers and approximate irrational numbers.
- Every repeating decimal equals a fraction, such as $0.\bar{3} = 1/3$.
- The square root of a whole number that is not a perfect square is irrational.
- Bracket a square root between two decimals whose squares surround the number.
- To compare two numbers, use decimals or square both positive numbers.