

Grade 8 - Rational and Irrational Numbers - Quiz

Common Core 8.NS.A.1, 8.NS.A.2 · maths-pdf.fr/en/

Name: _____ Class: _____ Date: ____/____/____

Pick the best answer for each of the 10 questions about rational and irrational numbers, repeating decimals and square root estimates (Common Core 8.NS.A.1 and 8.NS.A.2). Read each question carefully, then read the explanation to learn from any mistake.

Grade 8 · Common Core State Standards: **8.NS.A.1, 8.NS.A.2**

Questions

Question 1

Which number is irrational?

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

Question 2

Which fraction equals $0.\overline{3}$?

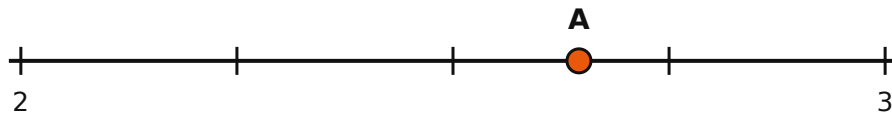
- A. $\frac{3}{10}$
- B. $\frac{3}{100}$
- C. $\frac{1}{30}$
- D. $\frac{1}{3}$

Question 3

Between which two integers is $\sqrt{90}$?

- A. 9 and 10
- B. 8 and 9
- C. 10 and 11
- D. 44 and 46

Question 4



Point A.

Which value is closest to point A?

- A. $\sqrt{5}$
- B. $\sqrt{7}$
- C. $\sqrt{8.5}$
- D. $\sqrt{4}$

Question 5

Which fraction in lowest terms equals $0.\overline{36}$?

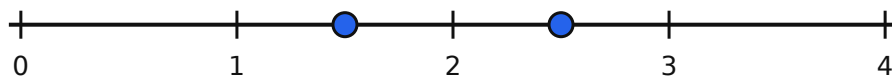
- A. $\frac{9}{25}$
- B. $\frac{4}{11}$
- C. $\frac{36}{99}$
- D. $\frac{3}{11}$

Question 6

Which is greater: $\sqrt{30}$ or 5.5?

- A. $\sqrt{30} > 5.5$
- B. $\sqrt{30} = 5.5$
- C. $5.5 > \sqrt{30}$
- D. Cannot be compared

Question 7



Two points on a number line.

Which statement about the points is true?

- A. Both are irrational
- B. Only 1.5 is rational
- C. Only 2.5 is rational
- D. Both are rational

Question 8

Which decimal is rational?

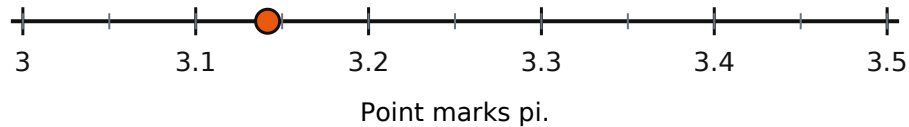
- A. $2.\overline{14}$
- B. 2.141141114...
- C. $\pi - 1$
- D. $\sqrt{2} + 1$

Question 9

A square game board has area 20 square inches. The side is closest to

- A. 4.5 in
- B. 4.0 in
- C. 5.0 in
- D. 10 in

Question 10



Which fraction is greater than the point shown, which marks π ?

- A. $\frac{157}{50}$
- B. $\frac{3}{1}$
- C. $\frac{22}{7}$
- D. $\frac{314}{100}$

Answers

1. **B** - 17 is not a perfect square, so its root never ends or repeats. $\sqrt{16} = 4$ is rational.
2. **D** - Let $x = 0.333\dots$; then $10x - x = 3$, so $x = 3/9 = 1/3$. Using $3/10$ forgets the repeat.
3. **A** - $9^2 = 81$ and $10^2 = 100$, and 90 is between them. Halving 90 gives the wrong 45.
4. **B** - A is near 2.65 and $2.65^2 \approx 7$. $\sqrt{4} = 2$ is at the left end.
5. **B** - $0.\overline{36} = \frac{36}{99}$, and dividing top and bottom by 9 gives $\frac{4}{11}$. The fraction $36/99$ is not in lowest terms.
6. **C** - $5.5^2 = 30.25 > 30$, so 5.5 is larger.
7. **D** - $1.5 = 3/2$ and $2.5 = 5/2$ are fractions of integers.
8. **A** - A repeating decimal is rational. The pattern 2.141141114... never repeats.
9. **A** - $4.5^2 = 20.25$. Dividing 20 by 2 gives the wrong 10.
10. **C** - $22/7 = 3.1428\dots$ is above $3.14159\dots$. The others are 3.14, 3, 3.14.

Remember

- Terminating and repeating decimals are rational; every rational number can be written as a fraction.
- Square roots of non-perfect squares, and π , are irrational.
- To write $0.\overline{7}$ as a fraction, multiply by 10, subtract, and divide: $\frac{7}{9}$.
- Estimate $\sqrt{n}$ by finding the two perfect squares around n , then refine to tenths and hundredths.
- Compare real numbers by converting them to decimals with the same number of places.