

Grade 8 - Rational and Irrational Numbers - Test Answer Key

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

Use this answer key to score the rational and irrational numbers test out of 20 points. Each solution shows the full work and a scoring guide, so partial credit can be given fairly when a student shows correct steps but makes an arithmetic slip.

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

Question 1 - Fractions and decimals [3 pts]

- a. $7 \div 8 = 0.875$.
- b. $4 \div 9 = 0.444\dots$, so $0.\overline{4}$.
- c. Yes. It is a fraction of two integers (its decimal terminates).

Scoring: 1 point for 0.875. 1 point for $0.\overline{4}$. 1 point for a correct reason.

Question 2 - Convert to a fraction [3 pts]

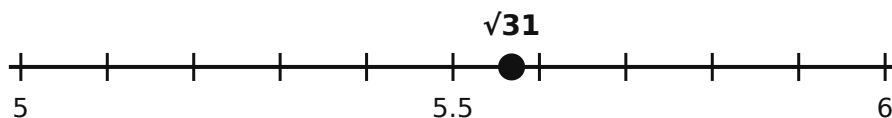
- a. $10x - x = 5$, so $x = \frac{5}{9}$.
- b. $100x - x = 18$, so $99x = 18$ and $x = \frac{18}{99} = \frac{2}{11}$.

Scoring: Part a: 1 point. Part b: 1 point for the setup $99x = 18$, 1 point for $\frac{2}{11}$.

Question 3 - Locate a point [2 pts]

$5^2 = 25$ and $6^2 = 36$, so $5 < \sqrt{31} < 6$.

$5.5^2 = 30.25$ and $5.6^2 = 31.36$; 31 is closer to 31.36.



The square root of 31 is about 5.57, near 5.6.

5 and 6; about 5.6

Scoring: 1 point for 5 and 6. 1 point for 5.6 with work.

Question 4 - Classify [2 pts]

- a. rational (equals 9)
- b. irrational (15 is not a perfect square)
- c. rational (repeating decimal)
- d. irrational (a nonzero rational times π)

Scoring: Half a point each, rounded up: 2 points for 4 correct, 1 point for 2 or 3 correct.

Question 5 - Order the numbers [2 pts]

$$\sqrt{10} \approx 3.162, \frac{16}{5} = 3.2, 3.\bar{2} = 3.2222\dots$$

$$3.1, \sqrt{10}, \frac{16}{5}, 3.\bar{2}$$

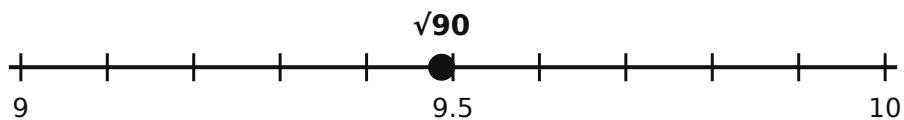
Scoring: 2 points for the correct order; 1 point if only one number is misplaced.

Question 6 - Compare [2 pts]

- a. $8.7^2 = 75.69 > 75$, so $\sqrt{75} < 8.7$.
- b. $\pi = 3.14159\dots > 3.14$.

Scoring: 1 point for each correct comparison with a reason.

Question 7 - Square rug [3 pts]



The side is about 9.5 feet.

- a. Side = $\sqrt{90}$.
- b. $9^2 = 81$ and $10^2 = 100$, so between 9 and 10.
- c. $9.5^2 = 90.25$ and $9.4^2 = 88.36$; 90 is closer to 90.25: about 9.5 ft.

Scoring: 1 point per part.

Question 8 - Explain [3 pts]

Let $x = 0.\overline{9}$. Then $10x = 9.\overline{9}$, and $9x = 9$, so $x = 1$.

Maya is wrong: $0.\overline{9}$ equals 1, a rational number.

Scoring: 1 point for saying she is wrong. 1 point for setting up and subtracting. 1 point for the result $x = 1$.

Total
20 points