

Radicals Quiz Answer Key PDF

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How do you rationalize the denominator of the fraction $1/(2 + \sqrt{3})$?

Multiply the numerator and the denominator by the conjugate of the denominator, which is $(2 - \sqrt{3})$, resulting in $(2 - \sqrt{3})/(4 - 3) = (2 - \sqrt{3})$.

Provide an example of a real-world application of radicals.

Radicals are used in geometry to calculate the length of the hypotenuse in right triangles using the Pythagorean theorem, such as finding the hypotenuse of a triangle with legs of length 5 and 12, resulting in $\sqrt{5^2 + 12^2} = \sqrt{169} = 13$.

Explain why $\sqrt{a \cdot b} = \sqrt{a} \cdot \sqrt{b}$ is valid for non-negative a and b.

This property holds because the square root function is defined as the inverse of squaring, and for non-negative numbers, the multiplication of roots corresponds to the root of the product, maintaining equality.

Explain the process of simplifying the radical expression $\sqrt{50}$.

Factor 50 into $25 \cdot 2$, where 25 is a perfect square. Thus, $\sqrt{50} = \sqrt{(25 \cdot 2)} = \sqrt{25} \cdot \sqrt{2} = 5\sqrt{2}$.

Describe how you would solve the equation $\sqrt{x} = 7$.

Square both sides of the equation to eliminate the square root: $(\sqrt{x})^2 = 7^2$, resulting in $x = 49$.

What is the importance of checking for extraneous solutions when solving radical equations?

Extraneous solutions can arise when both sides of an equation are squared, so it is important to substitute solutions back into the original equation to verify their validity.

Which of the following steps are involved in rationalizing the denominator of $1/\sqrt{3}$? (Select all that apply)

- A. Multiply numerator and denominator by $\sqrt{3}$ ✓
- B. Multiply numerator and denominator by 3
- C. Simplify the expression ✓
- D. Use the conjugate

What is the radicand in the expression $\sqrt{36}$?

- A. 6
- B. 36 ✓
- C. 2
- D. $\sqrt{\quad}$

Which of the following radicals can be added directly? (Select all that apply)

- A. $\sqrt{2} + \sqrt{2}$ ✓
- B. $\sqrt{3} + \sqrt{5}$
- C. $2\sqrt{7} + 3\sqrt{7}$ ✓
- D. $\sqrt{6} + \sqrt{6}$ ✓

What is the index of the fourth root of 81?

- A. 1
- B. 2
- C. 3
- D. 4 ✓

What is the result of multiplying $\sqrt{5}$ by $\sqrt{5}$?

- A. 5 ✓
- B. 10
- C. 25

D. $\sqrt{25}$

Which of the following is a perfect square?

- A. 18
- B. 25 ✓**
- C. 30
- D. 45

What is the simplified form of $\sqrt{64}$?

- A. 6
- B. 7
- C. 8 ✓**
- D. 9

What is the simplified form of $\sqrt{(25/9)}$?

- A. $5/3$ ✓**
- B. $3/5$
- C. $\sqrt{5/3}$
- D. $5/\sqrt{3}$

Which property allows you to write $\sqrt{a} * \sqrt{b}$ as $\sqrt{a*b}$?

- A. Quotient Property
- B. Product Property ✓**
- C. Power Property
- D. Addition Property

Which of the following are true about the expression $\sqrt{a^2}$? (Select all that apply)

- A. It equals a
- B. It equals $|a|$ ✓**
- C. It is always positive ✓**
- D. It is the square root of a squared ✓**

Which of the following expressions are equivalent to 1? (Select all that apply)

- A. $\sqrt{1}$ ✓
- B. $\sqrt{(9/9)}$ ✓
- C. $\sqrt{(16/16)}$ ✓
- D. $\sqrt{(25/25)}$ ✓

Which of the following are perfect cubes? (Select all that apply)

- A. 8 ✓
- B. 27 ✓
- C. 64 ✓
- D. 100

Which of the following expressions can be simplified to an integer? (Select all that apply)

- A. $\sqrt{4}$ ✓
- B. $\sqrt{10}$
- C. $\sqrt{16}$ ✓
- D. $\sqrt{36}$ ✓

Which of the following is the conjugate of $4 + \sqrt{3}$?

- A. $4 - \sqrt{3}$ ✓
- B. $4 + \sqrt{3}$
- C. $-4 + \sqrt{3}$
- D. $-4 - \sqrt{3}$