

Algebra 2 · Radicals and Rational Exponents · Quiz

Common Core N-RN.A.1, N-RN.A.2, A-REI.A.2 · mathovore.fr

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

Try these ten multiple-choice questions on nth roots, rational exponents, simplifying radicals and radical equations. Each question has exactly one correct answer, and the explanation points out the mistake that the wrong choices come from.

Algebra 2 Common Core: N-RN.A.1 · N-RN.A.2 · A-REI.A.2

Questions

Question 1

What is the value of $125^{2/3}$?

- A. 5
- B. 25
- C. $\frac{1}{25}$
- D. 10

Question 2

Which radical is equal to $x^{3/5}$?

- A. $\sqrt[3]{x^5}$
- B. $3^5\sqrt{x}$
- C. $\sqrt[5]{x^3}$
- D. $\sqrt[8]{x}$

Question 3

Which is $\sqrt{98}$ in simplest form?

- A. $49\sqrt{2}$
- B. $2\sqrt{7}$
- C. $7\sqrt{14}$
- D. $7\sqrt{2}$

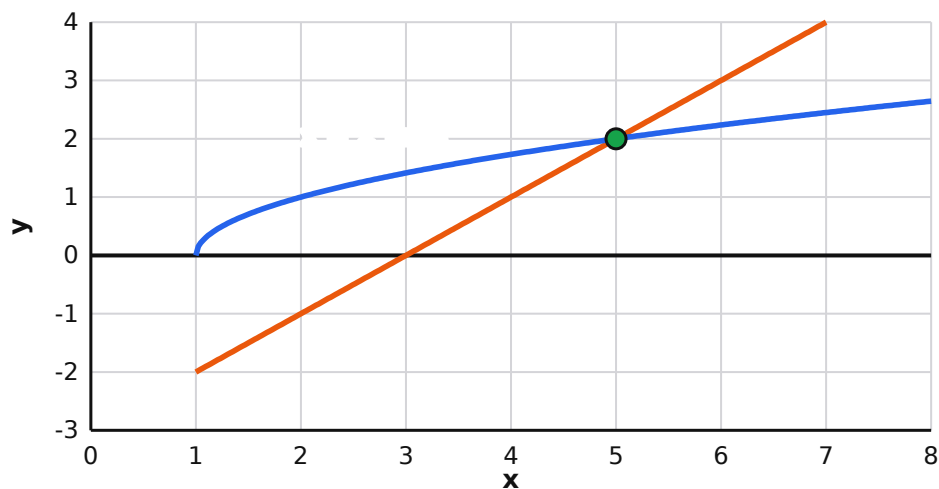
Question 4

What is $\sqrt[3]{-8}$?

- A. -2
- B. 2
- C. -4
- D. not a real number

Question 5

What is the solution set of the equation whose graphs are shown?



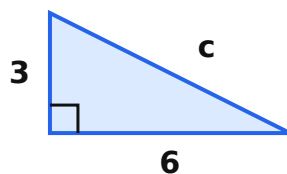
Graphs of $y = \sqrt{x-1}$ and $y = x-3$.

$$\sqrt{x-1} = x-3$$

- A. $x=2$ only
- B. $x=2$ and $x=5$
- C. $x=5$ only
- D. no solution

Question 6

What is the exact length of the hypotenuse?



Not drawn to scale.

- A. 9
- B. $3\sqrt{3}$
- C. $\sqrt{15}$
- D. $3\sqrt{5}$

Question 7

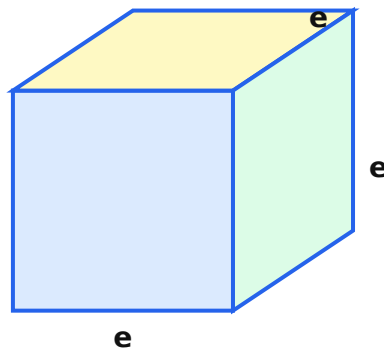
Simplify $2\sqrt{12} + \sqrt{27}$.

- A. $7\sqrt{3}$
- B. $3\sqrt{39}$
- C. $5\sqrt{3}$
- D. $7\sqrt{6}$

Question 8

A cube has a volume of 24 cubic units. What is its exact edge length?

$$V = 24 \text{ cubic units}$$



Not drawn to scale.

- A. $3\sqrt[3]{2}$
- B. $2\sqrt[3]{3}$
- C. $2\sqrt{6}$
- D. $6\sqrt[3]{4}$

Question 9

What is the value of $16^{-3/4}$?

- A. $\frac{1}{8}$
- B. 8
- C. -8
- D. $\frac{1}{12}$

Question 10

Simplify $(x^{2/3})^{3/4}$ for $x > 0$.

- A. $x^{17/12}$
- B. $x^{8/9}$
- C. x^2
- D. $x^{1/2}$

Answer key

1. **B** - $125^{2/3} = (\sqrt[3]{125})^2 = 5^2 = 25$. Stopping at the root gives 5.
2. **C** - The denominator 5 is the index and the numerator 3 is the power. Swapping them gives $\sqrt[3]{x^5}$.
3. **D** - $98 = 49 \cdot 2$, and $\sqrt{49} = 7$. Pulling out 49 without taking its root gives $49\sqrt{2}$.
4. **A** - $(-2)^3 = -8$, and odd roots of negative numbers are real. The sign must stay negative.
5. **C** - Squaring gives $x^2 - 7x + 10 = 0$, so $x = 2$ or $x = 5$. Checking: $x = 2$ gives 1 and -1 , which fails, so only $x = 5$ works.
6. **D** - $c = \sqrt{36 + 9} = \sqrt{45} = 3\sqrt{5}$. Adding the legs gives 9; subtracting the squares gives $3\sqrt{3}$.
7. **A** - $2\sqrt{12} = 4\sqrt{3}$ and $\sqrt{27} = 3\sqrt{3}$, so the sum is $7\sqrt{3}$. Radicands are not added.
8. **B** - $e = \sqrt[3]{24} = \sqrt[3]{8 \cdot 3} = 2\sqrt[3]{3}$. Using a square root instead of a cube root gives $2\sqrt{6}$.
9. **A** - $16^{3/4} = 2^3 = 8$, and the negative exponent means a reciprocal, so the value is $\frac{1}{8}$.
10. **D** - A power of a power multiplies exponents: $\frac{2}{3} \cdot \frac{3}{4} = \frac{1}{2}$. Adding them gives $\frac{17}{12}$.

Remember:

- Standards N-RN.A.1, N-RN.A.2 and A-REI.A.2: rational exponents, radical forms, and radical equations.
- $a^{m/n} = (\sqrt[n]{a})^m$: the denominator is the root index, the numerator is the power.
- An odd root of a negative number is real ($\sqrt[3]{-8} = -2$); an even root of a negative number is not real.
- Simplify by pulling out perfect powers: $\sqrt{72} = 6\sqrt{2}$ and $\sqrt[3]{54} = 3\sqrt[3]{2}$.
- Squaring both sides can create extraneous solutions, so every answer must be checked in the original equation.