

Algebra 1 · Exponent Rules, Radicals and Rational Exponents · Quiz

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

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

Ten multiple-choice questions check integer exponent rules, rational exponents and simplified radicals. Choose the one correct answer, then read the explanation to see the typical mistake. Several questions include a figure.

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

Questions

Question 1

What is $x^3 \cdot x^4$?

- A. x^{12}
- B. x^7
- C. $2x^7$
- D. x^1

Question 2

What is the value of 2^{-3} ?

- A. $\frac{1}{8}$
- B. -8
- C. -6
- D. $\frac{1}{6}$

Question 3

Simplify $(3x^2)^3$.

- A. $9x^6$
- B. $27x^5$
- C. $27x^6$
- D. $3x^6$

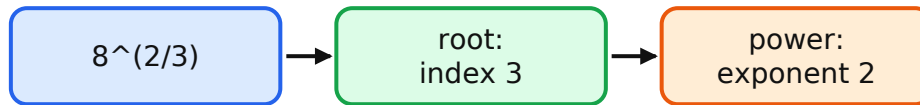
Question 4

What is $125^{1/3}$?

- A. 5
- B. 25
- C. 375
- D. $\frac{1}{5}$

Question 5

The figure shows how to read $8^{2/3}$. What is its value?

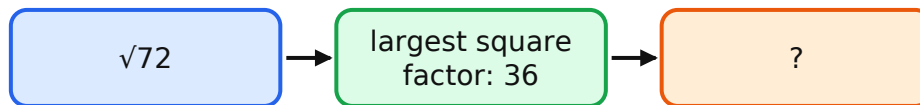


Denominator = root, numerator = power.

- A. $\frac{16}{3}$
- B. 4
- C. 16
- D. 2

Question 6

Which expression equals $\sqrt{72}$ in simplest form?



Pull out the largest perfect square.

- A. $36\sqrt{2}$
- B. $6\sqrt{3}$
- C. $12\sqrt{6}$
- D. $6\sqrt{2}$

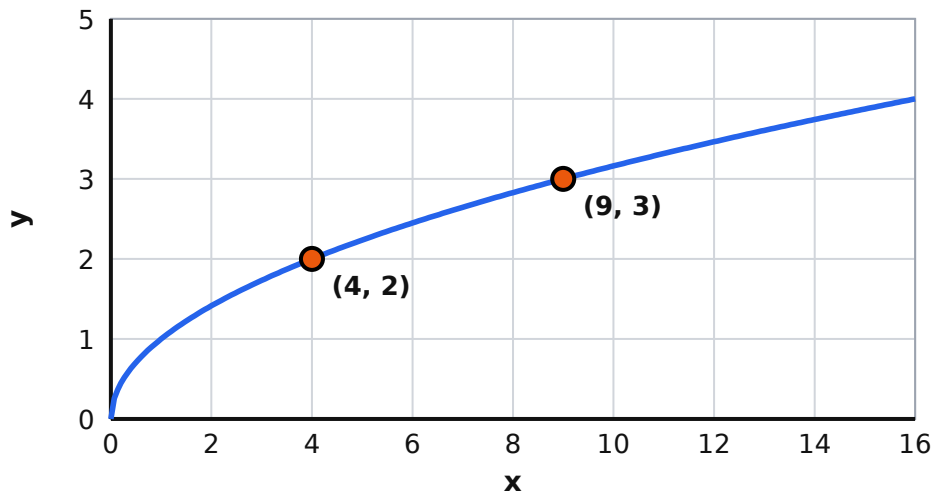
Question 7

Which is equal to $\sqrt[3]{x^2}$?

- A. $x^{3/2}$
- B. $x^{-2/3}$
- C. $x^{2/3}$
- D. x^6

Question 8

Which equation matches the curve that passes through (4, 2) and (9, 3)?

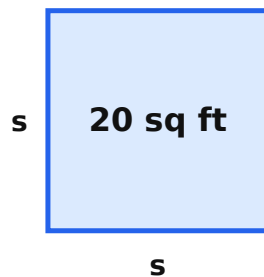


A curve through (4, 2) and (9, 3).

- A. $y = x^2$
- B. $y = \frac{x}{2}$
- C. $y = x^{-1/2}$
- D. $y = x^{1/2}$

Question 9

A square patio has area 20 square feet. What is the side length?



Area 20 square feet.

- A. $2\sqrt{5}$ ft
- B. $4\sqrt{5}$ ft
- C. $5\sqrt{2}$ ft
- D. 10 ft

Question 10

Simplify $\frac{x^8}{x^{-2}}$.

- A. x^6
- B. x^{-6}
- C. x^{-16}
- D. x^{10}

Answer key

1. **B** - Same base, so add the exponents: $3 + 4 = 7$. Multiplying the exponents (12) is the usual mistake.
2. **A** - A negative exponent means a reciprocal: $2^{-3} = \frac{1}{2^3} = \frac{1}{8}$, not a negative number.
3. **C** - Cube both factors: $3^3 = 27$ and $(x^2)^3 = x^6$.
4. **A** - The exponent $\frac{1}{3}$ means cube root, and $5^3 = 125$.
5. **B** - Cube root of 8 is 2, then $2^2 = 4$. Multiplying 8 by $\frac{2}{3}$ is a common mistake.
6. **D** - $\sqrt{72} = \sqrt{36 \cdot 2} = 6\sqrt{2}$. The root of 36 is 6, not 36.
7. **C** - The index 3 goes in the denominator and the power 2 in the numerator.
8. **D** - $4^{1/2} = 2$ and $9^{1/2} = 3$. The line $y = \frac{x}{2}$ gives 4.5 at $x = 9$.
9. **A** - $\sqrt{20} = \sqrt{4 \cdot 5} = 2\sqrt{5}$.
10. **D** - Subtract exponents: $8 - (-2) = 10$. Subtracting a negative adds.

Remember:

- Product rule: $x^m \cdot x^n = x^{m+n}$; quotient rule: subtract the exponents.
- Power of a power: multiply the exponents, $(x^m)^n = x^{mn}$.
- $x^0 = 1$ and $x^{-n} = \frac{1}{x^n}$ for $x \neq 0$.
- $x^{m/n} = (\sqrt[n]{x})^m$: root in the denominator, power in the numerator.
- Simplify a square root by pulling out the largest perfect square factor.