

Algebra 1 · Exponent Rules, Radicals and Rational Exponents · Test Answer Key

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

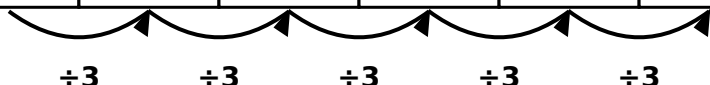
Full worked solutions with a scoring guide for each of the nine questions. Award each point separately, and accept any correct equivalent form unless the question asks for simplest form. A total of 20 points is possible.

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

Question 1: Powers of 3 (2 points)

- a. Dividing 3 by 3 gives $3^0 = 1$.
 b. Dividing $\frac{1}{3}$ by 3 gives $3^{-2} = \frac{1}{9}$.

n	3	2	1	0	-1	-2
3^n	27	9	3	1	$\frac{1}{3}$	$\frac{1}{9}$



Completed table.

Scoring: 1 point for each correct value.

Question 2: Monomial products and quotients (2 points)

- a. $(4)(-2) = -8$, x^5, y^5 : $-8x^5y^5$.
 b. $3a^5b$: $3a^5b$.

Scoring: 1 point for each correct simplified expression.

Question 3: Combining power rules (2 points)

- a. $x^{-8} \cdot x^{11} = x^3$.
 b. $2^3 x^{-6} y^3 = 8x^{-6} y^3 = \frac{8y^3}{x^6}$.

Scoring: 1 point for each correct answer. Part (b) needs positive exponents.

Question 4: Rational exponent values (2 points)

- a. $(\sqrt{25})^3 = 5^3 = 125$.
- b. $32^{2/5} = (\sqrt[5]{32})^2 = 2^2 = 4$, so $32^{-2/5} = \frac{1}{4}$.

Scoring: 1 point for each correct value; in part (b), 0 points for the answer 4 or -4.

Question 5: Radical and exponent forms (2 points)

- a. $x^{4/3}$
- b. $\sqrt{y^5}$ (or $(\sqrt{y})^5$, or $y^2\sqrt{y}$).

Scoring: 1 point for each correct form. Accept any equivalent radical in part (b).

Question 6: Simplify square roots (3 points)

- a. $\sqrt{9 \cdot 5} = 3\sqrt{5}$.
- b. $\sqrt{16 \cdot 5} = 4\sqrt{5}$.
- c. $12x^5 = 4 \cdot 3 \cdot x^4 \cdot x$, so $2x^2\sqrt{3x}$.

Scoring: 1 point for each fully simplified answer. No credit if a perfect square factor remains under the root.

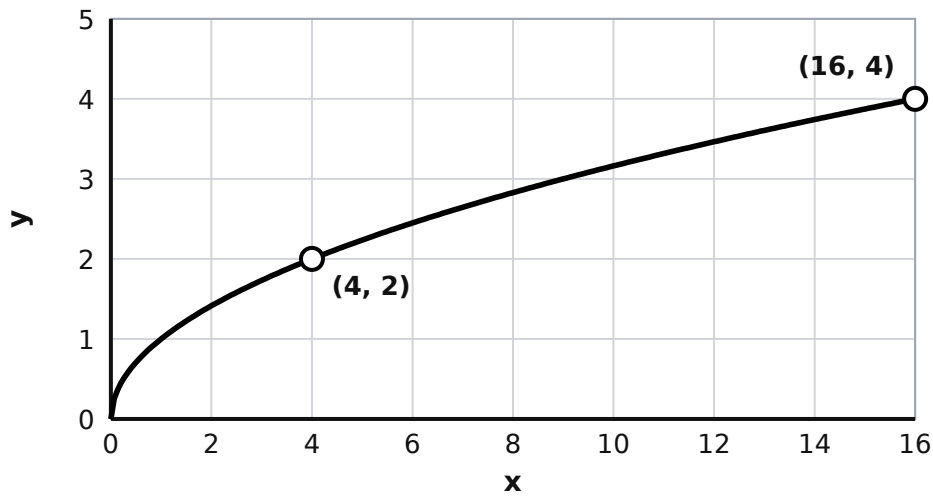
Question 7: Exponent rules with fractions (2 points)

- a. $x^{3/4 \cdot 8} = x^6$.
- b. $x^{7/3 - 1/3} = x^2$; x^2 .

Scoring: 1 point for each correct power of x .

Question 8: Graph of a rational power (3 points)

- a. The graph passes through (16, 4), so $y = 4$.
- b. $y = \sqrt{x}$
- c. Yes. $25^{1/2} = \sqrt{25} = 5$, so (25, 5) satisfies the equation.

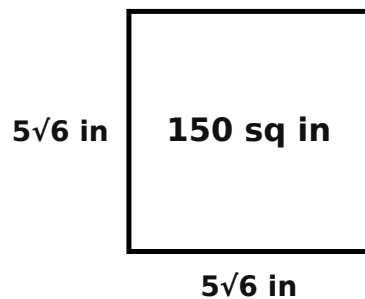


Reading $y = 4$ at $x = 16$.

Scoring: 1 point for the value, 1 point for the radical form, 1 point for substituting 25 and getting 5.

Question 9: Square frame (2 points)

$s = \sqrt{150} = \sqrt{25 \cdot 6} = 5\sqrt{6}$ in. Since $\sqrt{6} \approx 2.449$, $s \approx 12.2$ in.



Side $5\sqrt{6}$ in ≈ 12.2 in.

Scoring: 1 point for the simplified radical, 1 point for the decimal.

Total
20 points