

Algebra 1 - Exponent Rules and Radicals - Test Answer Key

Common Core N-RN.A.1, N-RN.A.2, N-RN.B.3 · maths-pdf.fr/en/

Grade the exponent rules test with this key. Every question lists the points available and how to split them between method and result. Students who show clear work should receive partial credit, even if the final answer is not correct. The test totals 20 points in all.

Algebra 1 · Common Core State Standards: **N-RN.A.1, N-RN.A.2, N-RN.B.3**

Question 1 - Evaluate with exponent rules [2 pts]

a) $2^{5+(-2)} = 2^3 = 8$.

b) $\frac{3^6}{3^4} = 3^2 = 9$.

8; 9

Scoring: 1 point for each part.

Question 2 - Power of a product [2 pts]

Square every factor: $4^2 = 16$, $(x^3)^2 = x^6$, $(y^2)^2 = y^4$.

$$16x^6y^4$$

Scoring: 1 point for the coefficient 16; 1 point for the exponents.

Question 3 - Negative exponents [2 pts]

Subtract exponents: $x^{-3-2} = x^{-5}$ and $y^{4-1} = y^3$.

x^{-5} belongs in the denominator.

$$\frac{y^3}{x^5}$$

Scoring: 1 point for the exponents; 1 point for positive exponents.

Question 4 - Simplify a radical [2 pts]

Factor pair of 98	Perfect square
2×49	$49 = 7^2$

The greatest perfect square factor is 49.

$$\sqrt{98} = \sqrt{49 \cdot 2} = 7\sqrt{2}.$$

$7\sqrt{2}$ inches

Scoring: 1 point for factoring out 49; 1 point for the simplified form.

Question 5 - Rational exponents [2 pts]

a) $\sqrt[3]{64} = 4$.

b) $(\sqrt{9})^3 = 3^3 = 27$.

4; 27

Scoring: 1 point for each part.

Question 6 - Radicals and exponents [2 pts]

a) $\sqrt[4]{x^3}$.

b) $y^{2/5}$.

Scoring: 1 point for each part.

Question 7 - Rational or irrational [3 pts]

a) $\sqrt{81} = 9$ is rational.

b) 11 is not a perfect square, so $\sqrt{11}$ is irrational.

c) If $3 + \sqrt{5}$ were rational, subtracting 3 would make $\sqrt{5}$ rational, which is false.

rational; irrational; irrational

Scoring: 1 point per part.

Question 8 - Population model [3 pts]

Hours t	0	3	4
P	50	1350	4050

Key values of P.

- a) $50 \cdot 3^0 = 50$.
- b) $50 \cdot 3^4 = 50 \cdot 81 = 4050$.
- c) $50 \cdot 3^t = 1350$, so $3^t = 27 = 3^3$ and $t = 3$.

50; 4,050; 3 hours

Scoring: 1 point per part.

Question 9 - Find the error [2 pts]

The power applies to both factors, 2 and x . The student cubed only x .

$$(2x)^3 = 2^3 x^3 = 8x^3.$$

$$8x^3$$

Scoring: 1 point for the explanation; 1 point for the correct result.

Total

20 points