

Algebra 1 - Exponent Rules and Radicals - Worksheet

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

Name: _____ Class: _____ Date: ____/____/____

Use these 20 problems to master exponent rules and radicals (Common Core N-RN.A.1, N-RN.A.2, and N-RN.B.3). You will use product, quotient, and power rules, work with zero and negative exponents, simplify radicals, and classify rational and irrational numbers. They move from quick warm-ups to multistep word problems, so slow down on the last six and check that each answer makes sense.

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

Exercise 1 - Evaluate a power



Four factors of 3.

Evaluate 3^4 .

Exercise 2 - Product rule

Simplify $x^5 \cdot x^3$ and evaluate $2^3 \cdot 2^4$.

Exercise 3 - Quotient rule

Simplify $\frac{x^9}{x^4}$.

Exercise 4 - Power of a power

Simplify $(x^3)^4$.

Exercise 5 - Zero exponent

Evaluate 7^0 , $(-5)^0$, and $(5x)^0$ for $x \neq 0$.

Exercise 6 - Negative exponent

3^2	3^1	3^0	3^{-1}	3^{-2}
9	3	1	$1/3$	?

Each step to the right divides by 3.

Evaluate 3^{-2} .

Exercise 7 - Power of a product

Simplify $(2x^4)^3$.

Exercise 8 - Negative exponent in a term

Write $4x^{-2}$ with a positive exponent.

Exercise 9 - Quotient of monomials

Simplify $\frac{6x^5y^2}{2x^2y}$.

Exercise 10 - Several rules

Simplify $(2x^3y^{-2})^2$ using positive exponents.

Exercise 11 - Simplify a radical

Simplify $\sqrt{48}$.

Exercise 12 - Simplify another radical

Factor pairs of 200	Perfect square?
2×100	$100 = 10^2$
8×25	$25 = 5^2$
4×50	$4 = 2^2$

Choose the largest perfect square.

Rewrite $\sqrt{200}$ in simplest radical form.

Exercise 13 - Rational exponents

Evaluate $25^{1/2}$, $27^{2/3}$, and $16^{3/4}$.

Exercise 14 - Radical and exponent forms

Write $5^{1/2}$ as a radical and $\sqrt[3]{x^2}$ with a rational exponent.

Exercise 15 - Rational or irrational



Numbers on the number line.

Classify each number as rational or irrational: $\sqrt{9}$, $\sqrt{10}$, $0.\bar{3}$, π .

Exercise 16 - Bacteria

Hours t	0	1	2	3
P	100	200	400	800

The first hours.

A culture starts with 100 bacteria and doubles every hour, so $P = 100 \cdot 2^t$ after t hours. Find the population after 6 hours.

Exercise 17 - Computer memory

One kilobyte is 2^{10} bytes, and one megabyte is 2^{10} kilobytes. Use the product rule to write the number of bytes in one megabyte as a power of 2, then evaluate.

Exercise 18 - Square garden

A square garden has area 75 square feet. Find the side length in simplest radical form and as a decimal to the nearest hundredth.

Exercise 19 - Falling object

The time in seconds for an object to fall h feet is $t = \frac{\sqrt{h}}{4}$. Find the time to fall 64 feet and 50 feet (simplest radical form).

Exercise 20 - Explain irrational sums

Explain why $\frac{1}{2} + \sqrt{2}$ is irrational.

Exercise 21 - Sunlight travel time

Light travels about 1.86×10^5 miles per second. The Sun is about 9.3×10^7 miles away. Use the quotient rule to find the travel time in seconds.