Exponent Practice Worksheet Answer Key PDF

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Part 1: Building a Foundation

What is the value of \(3^0\)?

undefined. 0
undefined. 1 ✓
undefined. 3
undefined. Undefined

The value of any non-zero number raised to the power of zero is 1.

Which of the following expressions are equal to \(2^3\)? (Select all that apply)

undefined. \(2 \times 2 \times 2\) ✓
undefined. \(4 \times 2\)
undefined. \(8\) ✓
undefined. \(2^2 + 2\)

The expressions that equal \(2^3\) are those that represent multiplying 2 three times.

Explain in your own words what an exponent represents in a mathematical expression.

An exponent indicates how many times the base is multiplied by itself.

Identify the base and exponent in the expression \(5^4\).

1. Base
5

2. Exponent
4

The base is 5 and the exponent is 4.

What is the result of \(10^{-1}\)?

undefined. 10
undefined. 0.1 ✓
undefined. -10
undefined. 1

A negative exponent indicates the reciprocal of the base raised to the positive exponent.

Part 2: Comprehension and Application

Which of the following expressions is equivalent to \((x^2)^3\)?

undefined. \(x^5\)
undefined. \(x^6\) ✓
undefined. \(x^8\)
undefined. \(x^9\)

The expression simplifies using the rule \((a^m)^n = a^{m \cdot n}\).

Which statements are true about the expression \(\frac{a^5}{a^2}\)? (Select all that apply)

undefined. It simplifies to \(a^3\). ✓
undefined. It is equivalent to \(a^{10}\).
undefined. It can be rewritten as \(a^{5-2}\). ✓
undefined. It equals \(a^7\).

The expression simplifies using the rule \(\frac{a^m}{a^n} = a^{m-n}\).

Calculate the value of \((2^3 \times 5^2) \div 10\).

Calculate \(2^3 = 8\) and \(5^2 = 25\), then divide the product by 10.

If a bacteria culture doubles every hour, which expression represents the population after 3 hours if the initial population is \(P\)?

undefined. \(P \times 2^3\) ✓
undefined. \(P + 3\)
undefined. \(P^3\)
undefined. \(3P\)

The population doubles 3 times, which can be expressed as \(P \times 2^3\).

Part 3: Analysis, Evaluation, and Creation

Which expression correctly shows the use of the power of a quotient rule for \(\left(\frac{a}{ b}\right)^3\)?

undefined. \(\frac{a^3}{ b^3}\) ✓
undefined. \(\frac{a^3}{ b}\
undefined. \(\frac{a}{ b^3}\)
undefined. \(a^3 \div b^3\)

The power of a quotient rule states that \(\left(\frac{a}{ b}\right)^n = \frac{a^n}{ b^n}\).

Analyze the expression \((2^4 \times 2^{-2})\). Which of the following are true? (Select all that apply)

undefined. It simplifies to \(2^2\). ✓
undefined. It equals \(4\).
undefined. It is equivalent to \(2^{4-2}\). ✓
undefined. It equals \(16\).

The expression simplifies using the rule \(a^m \times a^n = a^{m+n}\).

Break down the expression \((x^3y^2)^2\) and explain each step of the simplification process.

Use the power of a product rule and the power of a power rule to simplify the expression.

Which of the following is the most simplified form of \((a^2 b^{-1})^3 \times a^{-6}\)?

undefined. \(a^0 b^{-3}\) ✓

undefined. \(b^{-3}\)
undefined. \(a^6 b^{-3}\)
undefined. \(a^{-6} b^{-3}\)

Apply the power of a product rule and combine like bases.

Create a real-world problem that involves using exponents to solve, and provide a detailed solution.

A real-world problem could involve population growth, financial interest, or radioactive decay.

Propose a scenario where understanding negative exponents is crucial, and explain why.

1. Scenario

Understanding scientific notation.

2. Explanation

Negative exponents represent values less than one.

Negative exponents are important in scientific notation and understanding reciprocals.