

Laws of Exponents (The Product Rule) worksheet 1

An exponent tell you how many times

To multiply the base.

From the picture on the right, the base is 2

And the exponent is 3, that mean 2 should

Be multiplied by itself 3 times

$$2 \times 2 \times 2$$

Using the Product Rule for Exponents

Review the example below to understand why we ADD the exponents when multiplying powers with the same base.

Example: 1) simplify $2^5 \cdot 2^3 =$

$$= 2 \times 2 \times 2 \times 2 \times 2 \cdot 2 \times 2 \times 2 = 2^8$$

$$= 2^5 \cdot 2^3 = 2^{5+3} = 2^8$$

Example 2) simplify $p^7 \cdot p^3 =$

$$= p \times p \times p \times p \times p \times p \times p \cdot p \times p \times p = p^{10}$$

$$= p^7 \cdot p^3 = p^{7+3} = p^{10}$$

Complete the table for each exercise, simplify the following using both the expanded form and the product rule.

Question	Use the Expanded form	Use the product rule (Add the exponents)
1) $5 \cdot 5^5$	$5 \cdot 5 \times 5 \times 5 \times 5 \times 5$ $= 5^6$	$5 \cdot 5^5 = 5^{1+5}$ $= 5^6$

2) $10^3 \cdot 10^5$		$10^3 \cdot 10^5 =$ $= 10$ $= 10$
3) $f^3 \cdot f$		$f^3 \cdot f =$ $= f$ $= f$
4) $c^4 \cdot c^3$		$c^4 \cdot c^3 =$ $= c$ c
5) $7^4 \cdot 7^3$		$7^4 \cdot 7^3 =$ $= 7$ $= 7$
6) $ab^3 \cdot a^4b^3$	$a \cdot b \cdot b \cdot b \cdot a \cdot a \cdot a \cdot a \cdot b \cdot b \cdot b$ $= a \quad b$	$ab^3 \cdot a^4b^3$ $= a \quad b$ $= a \quad b$
7) $g^3h^2 \cdot g^4h^3$		$g^3h^2 \cdot g^4h^3$ $g \quad h$ $= g \quad h$
8) $m^7n^2 \cdot mn^3$		$m^7n^2 \cdot mn^3$ $= m \quad n$ $= m \quad n$