

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  $2^5 \cdot 2^3 =$

$$\begin{aligned}
 &= 2 \times 2 \times 2 \times 2 \times 2 \times 2 \times 2 = 2^8 \\
 &= 2^5 \cdot 2^3 = 2^{5+3} = 2^8
 \end{aligned}$$

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

$$\begin{aligned}
 &= p \times p = p^{10} \\
 &= p^7 \cdot p^3 = p^{7+3} = p^{10}
 \end{aligned}$$

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 <b>(Add the exponents)</b>
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) $10^3 \cdot 10^5$	$= 10$	$10^3 \cdot 10^5 =$ $= 10$
3) $f^3 \cdot f$	$= f$	$f^3 \cdot f =$ $= f$
4) $c^4 \cdot c^3$	$= c$	$c^4 \cdot c^3 =$ $= c$
5) $7^4 \cdot 7^3$	$= 7$	$7^4 \cdot 7^3 =$ $= 7$
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) $g^3h^2 \cdot g^4h^3$	$= g \quad h$	$g^3h^2 \cdot g^4h^3$ $g \quad h$ $= g \quad h$
8) $m^7n^2 \cdot mn^3$	$= m \quad n$	$m^7n^2 \cdot mn^3$ $= m \quad n$ $= m \quad n$