

[1-6B] Use Properties of Integer Exponents

Name: _____

Power of a Power Property

Complete the table and answer the questions that follow.

Power	Expanded Form	Exponential Form
$(3^2)^3$	$3^2 \cdot 3^2 \cdot 3^2 =$ $(3 \cdot 3) \cdot (3 \cdot 3) \cdot (3 \cdot 3)$	3^6
$(2^3)^4$	$2^3 \cdot 2^3 \cdot 2^3 \cdot 2^3$ $(2 \cdot 2 \cdot 2)(2 \cdot 2 \cdot 2)(2 \cdot 2 \cdot 2)(2 \cdot 2 \cdot 2)$	2^{12}
$(4^5)^2$	$4^5 \cdot 4^5$ $(4 \cdot 4 \cdot 4 \cdot 4 \cdot 4)(4 \cdot 4 \cdot 4 \cdot 4 \cdot 4)$	4^{10}
$(x^7)^3$	$x^7 \cdot x^7 \cdot x^7$ $(x \cdot x \cdot x \cdot x \cdot x \cdot x \cdot x)(x \cdot x \cdot x \cdot x \cdot x \cdot x \cdot x)(x \cdot x \cdot x \cdot x \cdot x \cdot x \cdot x)$	x^{21}

Compare the original power in the first column to the exponential form you found in the third column. What patterns do you see? **same ; multiply the exponents. The base stays +**

Use the pattern to create a general rule for the power of a power property

$$(x^a)^b = \underline{x^{a \cdot b}}$$

Power of a Product Property

Complete the table and answer the questions that follow.

Power	Expanded Form	Exponential Form
$(2 \cdot 3)^4$	$(2 \cdot 3)(2 \cdot 3)(2 \cdot 3)(2 \cdot 3)$	$2^4 \cdot 3^4$
$(3 \cdot 5)^2$	$(3 \cdot 5)(3 \cdot 5)$	$3^2 \cdot 5^2$
$6^3 \cdot 7^3$	$6 \cdot 6 \cdot 6 \cdot 7 \cdot 7 \cdot 7$ $(6 \cdot 7)(6 \cdot 7)(6 \cdot 7)$	$(6 \cdot 7)^3$
$5^2 \cdot 4^2$	$5 \cdot 5 \cdot 4 \cdot 4$ $(5 \cdot 4)(5 \cdot 4)$	$(5 \cdot 4)^2$

Compare the original power in the first column to the exponential form you found in the third column. What patterns do you see?

If the exponents are the same multiply the bases ; keep the exponent

Use the pattern to create a general rule for the power of a product property

$$(xy)^b = \underline{x^b y^b}$$