Math 9   Date: _____   Name: _____

Write the repeated multiplication for the product of powers below

	Repeated Multiplication	Product as a Power
$5^4 \times 5^2$	5 x 5 x 5 x 5 X 5 x 5	Consider: How many times is **5 being multiplied?** 5^6
$6^3 \times 6^6$	6 x 6 x 6 x 6 x 6 x 6 x 6 x 6 x 6	
$7^3 \times 7^2$		
8×8^5		
$a^3 \times a^2$		

What patterns do we notice?

Exponent Law for Products of Powers:

When **multiplying** powers with the **same base**, <u>ADD</u> the **exponents**

$$a^m \times a^n = a^{m+n}$$

The variable a is any integer except 0. The variables m and n are any whole numbers.

Ex. $5^6 \times 5^2$

Ex. $a^9 \times a^3$

Ex. $4^{12} \times 4^{40}$

	Repeated Multiplication	Quotient As a Power
$5^4 \div 5^2$	$\dfrac{5 \times 5 \times 5 \times 5}{5 \times 5}$ **Remember: a number divided by itself = 1!**	$5 \underline{\quad}$
$6^6 \div 6^3$	$\dfrac{6 \times 6 \times 6 \times 6 \times 6 \times 6}{}$	$6 \underline{\quad}$
$7^6 \div 7^5$		
$d^6 \div d^4$		

multiplication.

Ex. $4^{6} \cdot 4^{-3}$

Show the division of powers in the form of repeated multiplication.

What pattern do we notice?

Exponent Law for a Quotient of Powers:

To divide powers with the same base, subtract the exponents.

$$a^m \; a^n = a^{m-n}$$

mn The variable a is any integer except 0. The variables m and n are any whole numbers.

Ex. $5^8 \div 5^4$

Ex. $(-3)^{9} \div (-3)^{2}$

Ex. $5^{18} \div 5^4$

Ex. $w^{36} \div w^{10}$