Name _____ Date _____

PRODUCT OF POWERS

You can multiply powers using the **Product of Powers Property.** It states that when you are multiplying powers with the same base, you can keep the base and add the exponents.

$$x^n \cdot x^m = x^{n+m}$$

Let's try it! Simplify $3^2 \cdot 3^4$ using the Product of Powers Property.

$$3^2 \cdot 3^4 = 3^{2+4} = 3^6$$

You can see why this property works by expanding each power and simplifying.

$$3^2 \cdot 3^4 = (3 \cdot 3) \cdot (3 \cdot 3 \cdot 3 \cdot 3) = 3 \cdot 3 \cdot 3 \cdot 3 \cdot 3 \cdot 3 = 3^6$$

Try it yourself! Multiply. Express each product as a power.

$4^3 \cdot 4^2 =$ _____	$2^5 \cdot 2^4 =$ _____	$5^2 \cdot 5^5 =$ _____
$9^3 \cdot 9^1 =$ _____	$11^4 \cdot 11^7 =$ _____	$3^7 \cdot 3^5 =$ _____
$7^8 \cdot 7^6 =$ _____	$6^{10} \cdot 6^{10} =$ _____	$13^7 \cdot 13^{15} =$ _____
$12^3 \cdot 12^2 \cdot 12^5 =$ _____	$10^4 \cdot 10^3 \cdot 10^6 =$ _____	$3^8 \cdot 3^1 \cdot 3^4 =$ _____
$11^2 \cdot 11^9 \cdot 11^7 =$ _____	$8^1 \cdot 8^7 \cdot 8^7 =$ _____	$9^{11} \cdot 9^7 \cdot 9^6 =$ _____