

Name \_\_\_\_\_

Date Answer Key

# 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.

$4^3 \cdot 4^2 = \underline{4^5}$

$2^5 \cdot 2^4 = \underline{2^9}$

$5^2 \cdot 5^5 = \underline{5^7}$

$9^3 \cdot 9^1 = \underline{9^4}$

$11^4 \cdot 11^7 = \underline{11^{11}}$

$3^7 \cdot 3^5 = \underline{3^{12}}$

$7^8 \cdot 7^6 = \underline{7^{14}}$

$6^{10} \cdot 6^{10} = \underline{6^{20}}$

$13^7 \cdot 13^{15} = \underline{13^{22}}$

$12^3 \cdot 12^2 \cdot 12^5 = \underline{12^{10}}$

$10^4 \cdot 10^3 \cdot 10^6 = \underline{10^{13}}$

$3^8 \cdot 3^1 \cdot 3^4 = \underline{3^{13}}$

$11^2 \cdot 11^9 \cdot 11^7 = \underline{11^{18}}$

$8^1 \cdot 8^7 \cdot 8^7 = \underline{8^{15}}$

$9^{11} \cdot 9^7 \cdot 9^6 = \underline{9^{24}}$