Name _____ Date Answer Key

POWER OF A POWER

The **Power of a Power Property** helps you simplify expressions that have a power raised to a power. It states that you can keep the base and multiply the exponents.

$$(x^n)^m = x^{n \cdot m}$$

Let's try it! Simplify $(7^3)^2$ using the Power of a Power Property.

$$(7^3)^2 = 7^{3 \cdot 2} = 7^6$$

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

$$(7^3)^2 = (7 \cdot 7 \cdot 7)^2 = (7 \cdot 7 \cdot 7) \cdot (7 \cdot 7 \cdot 7) = 7 \cdot 7 \cdot 7 \cdot 7 \cdot 7 \cdot 7 = 7^6$$

Try it yourself! Simplify each expression. Express each answer as a power.

$(8^2)^4 =$ 8^8	$(3^4)^5 =$ 3^{20}	$(7^3)^6 =$ 7^{18}
$(10^8)^2 =$ 10^{16}	$(4^5)^{10} =$ 4^{50}	$(5^7)^7 =$ 5^{49}
$(2^9)^6 =$ 2^{54}	$(8^7)^4 =$ 8^{28}	$(11^8)^8 =$ 11^{64}
$(9^9)^8 =$ 9^{72}	$(5^6)^{11} =$ 5^{66}	$(6^{12})^7 =$ 6^{84}
$(12^6)^{14} =$ 12^{84}	$(3^{18})^7 =$ 3^{126}	$(15^8)^{23} =$ 15^{184}