Exponents: Power to a Power

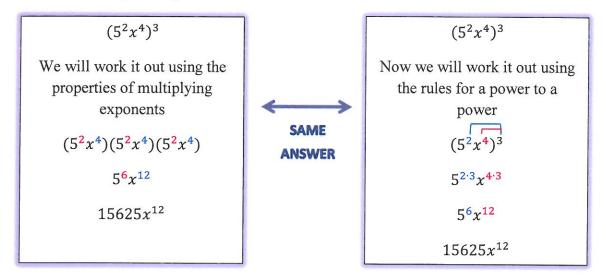
When exponents are applied to exponential expressions, multiply the exponents.

e.g.
$$(1)$$
 $(4^2)^3 = 4^{2 \cdot 3} = 4^6$

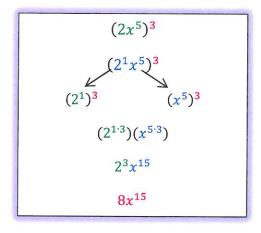
(2)
$$(x^3)^3 = x^{3\cdot 3} = x^9$$

(3)
$$(m^{-6})^2 = m^{-6 \cdot 2} = x^{-12}$$

When you have a power to a power it means the exponential expression in the brackets is the base of the exponent. The coefficient and the variables are being multiplied by itself the number of times indicated by the exponent.



Remember a coefficient that does not have a visible exponent is to the power of 1.



Examples:

| (a) | $(x^4)^{-2}$ $x^{4\cdot(-2)}$ x^{-8} | (b) | $(m^2)^6 \\ m^{2 \cdot 6} \\ m^{12}$ | (c) | $(3^{-4})^6$ $3^{(-4)\cdot 6}$ 3^{-24} |
|-----|--|-----|--------------------------------------|-----|--|
| (d) | $(5^{1}a^{4}b^{3})^{2}$ $(5^{2})(a^{8})(b^{6})$ $25a^{8}b^{6}$ | (e) | $(6^0)^0$ $(1)^1$ 1 | (f) | |