

Power to a Power

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aka Powers of a Product

Rule #3 - Power to a Power \rightarrow
Multiply the exponents

$$\text{ex) } (b^2)^3 = b^6$$

$$\underbrace{b^2 \cdot b^2 \cdot b^2}_{b \cdot b \cdot b \cdot b \cdot b \cdot b} \} b^6$$

$$(2^3)^3 = 2^9$$

$$2^{3 \cdot 3} = 2^9$$

Sep 13-1:39 PM

What if...

$$[(3^2)^2]^5 = 3^{20}$$

$$3^{2 \cdot 2 \cdot 5} = 3^{20}$$

$$(x^2 \cdot y^3)^4$$

$$x^8 y^{12}$$

$$[(h^3)^2]^4$$

$$h^{24}$$

$$(a^3 b^2 c^1)^5$$

$$a^{15} b^{10} c^5$$

Sep 17-9:24 AM

If there is more than 1 "piece" inside the parentheses, raise EVERYTHING to the power on the outside.

Ex) $(4a^2b)^3$

$4^3 a^6 b^3$

$64a^6b^3$

Sep 12-9:00 AM

Practice

① $(4b^2)^3$

$4^3 b^6 = 64b^6$

② $(6x^2y^4)^2$

$6^2 x^4 y^8$

$36x^4y^8$

③ $(7w^7)^3$

$7^3 w^{21}$

$343w^{21}$

④ $(-6r^5s^9)^3$

$-6^3 r^{15} s^{27}$

$-216r^{15}s^{27}$

Sep 17-9:30 AM

Putting it all together

$$\begin{aligned} & (\underline{2a^2} \cdot \underline{3a^3})^2 \\ & (6a^5)^2 \\ & 36a^{10} \end{aligned}$$

vs. $(2a^2 \cdot 3a^3)^2$

$$2^2 a^4 \cdot 3^2 a^6$$

$$4a^4 \cdot 9a^6$$

$$36a^{10}$$

on own: $(3b^2 \cdot 4b)^3$

Sep 17-11:00 AM