* Exponent — a number written just above and to the right of another number, which is called the base.

*Product Property of Exponents — when multiplying two expressions with the same base, add exponents and use the common base.

 e^{χ} , $3^2 \cdot 3^5 = 3^{2+5} = 3^7$ e^{χ} , $\chi^{\flat} \cdot \chi^{\flat} = \chi^{\flat^{+4}} = \chi^{10}$

*Power Property of Exponents — when raising a power to another power, you multiply the powers.

$$(5^3)^2 = 5^{3\cdot 2} = 5^6 \qquad e^{\chi}(\chi^2)^4 = \chi^{2\cdot 4} = \chi^8$$

* Distributive Property of Powers — when something multiplied together is raised to a power, it is the same thing as each base raised to that power.

$$(\chi y)^{3} = \chi^{3} y^{3}$$
 e_{χ}^{3} $(\chi y)^{3} = \chi^{3} \chi^{3} y^{3}$

1. Complete the expression.

complete the expression.
a)
$$W^{P} \cdot W^{r} = W^{P+r}$$
 ~ make sure to put U around exponent around exponent around exponent around exponent around exponent around exponent.
b) $U_{4}^{b} \cdot U_{5}^{s} = U_{4}^{b+s} = U_{4}^{m}$ · Type base 1st
c) $3^{4} \cdot 3^{2} = 3^{4+2} = 3^{b} \cdot or - 729$ · Type base 1st
· Then click on χ^{P} in alrop down box.
· Then type expansent, · Then type expansent,

2. Use the product property to simplify this expression.

$$k_{12} \cdot k_{10} \cdot k_{8} \cdot k_{9} = k_{36}$$

3. Simplify.

$$(\chi^{3} y^{3})(\chi^{2} y^{4})$$

$$\chi^{3} \cdot \chi^{2} \cdot y^{3} \cdot y^{4}$$

$$\chi^{3+2} \cdot y^{3+4}$$

$$\chi^{5} \cdot \chi^{1}$$

$$\chi^{5} \chi^{1}$$

- * Put Like terms together.
- * Then since they are multiplied together, we add the exponents of like terms.

4. Simplify.

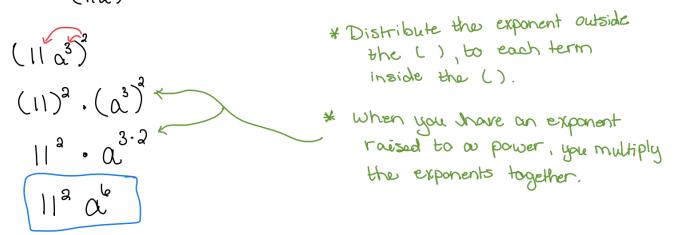
* Put Like terms together. * Then since they are multiplied together, we add the exponents of like terms.

5. Complete the statement of the power rule. And simplify.

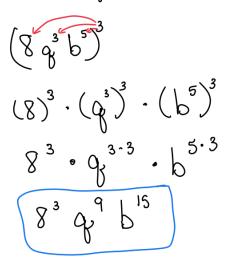
a)
$$(y^{c})^{d} = y^{c \cdot d}$$

b) $(w^{5})^{4} = w^{5 \cdot 4} = w^{20}$
c) $(2^{4})^{2} = 2^{4 \cdot 2} = 2^{8}$
d) $3^{5} \cdot 3^{3} = 3^{5+3} = 3^{8}$ ~ Here we add the exponents, because the bases are multiplied together.

6. Simplify this expression by using the properties of exponents. You may leave your answer as a number to a power. $(\chi_{A})^{2}$

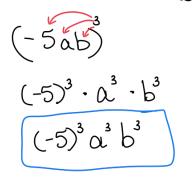


7. Simplify this expression by using the properties of exponents. You may leave your answer as a number to a power. $(8_{3}, b^{5})^{3}$



- * Distribute the exponent outside the (), to each term inside the ().
- * When you shave an exponent raised to a power, you multiply the exponents together.

8. Use the distributive property of exponents to simplify this expression. You may leave your answer as a number to a power. $(-5 ab)^3$



- * Distribute the exponent outside the (), to each term inside the ().
- * When you shave an exponent raised to a power, you multiply the exponents together.
- * if you have a (=) number don't forget to keep it in ().