Multiplying Powers with Like Bases

- X^2

  – X is the base. 2 is the exponent

  When multiplying powers with the same base, keep the base and add the exponents

Simplify

1.) $6^3 \cdot 6^4 = 6^{3+4} = 6^7$

2.) $p^4 \cdot p^7 = p^{11}$

3.) $x^8 \cdot x \cdot x^3 = x^{8+1+3} = x^{12}$

4.) $(x^4 y^6)(x^2 y^7) = x^4 \cdot x^2 \cdot y^6 \cdot y^7$
$= x^6 y^{13}$

Dividing Using exponents

- Keep the base and subtract the exponents

Simplify. Express using exponents.

1.) $\dfrac{4^7}{4^2} = 4^{7-2} = 4^5$

2.) $\dfrac{w^6}{w^2} = w^{6-2} = w^4$

3.) $\dfrac{a^4}{a^2} = a^{4-2} = a^2$

4.) $\dfrac{m^5 n^6}{m^4 n^3} = m^{5-4} n^{6-3}$

$= mn^3$

YOU CANNOT HAVE NEGATIVE EXPONENTS!!!

- If you have a negative exponent in the top of a fraction, bring it to the bottom and make the exponent positive!

  - Ex. $x^{-4} = \dfrac{1}{x^4}$

- If you have a negative exponent in the bottom of a fraction, bring it to the top and make the exponent positive!

  - Ex. $\dfrac{2}{3x^{-5}} = \dfrac{2x^5}{3}$

Express Using Positive Exponents

- $\dfrac{3^{-3}}{1} = \dfrac{1}{3^3}$

- $\dfrac{x^{-4}}{1} = \dfrac{1}{x^4}$

- $\dfrac{4y^{-8}}{1} = \dfrac{4}{y^8}$

$(2x)^{-1} = \dfrac{1}{2x}$

What do I do when my exponent is 0?

- If a number has a 0 as an exponent, it equals 1, except for 0.

  - Ex. $5^0 = 1$
  - $x^0 = 1$
  - $1,564,328^0 = 1$

$$\frac{5^8}{5^8} = 5^{8-8} = 5^0 = 1$$

Simplify

- $8^0 = 1$

P.

- $\dfrac{x^8}{x^8} = 1$