Exponential Equations

$q^m q^n = q^{m+n}$ q has to be the same number.

Ex

$2^2 \cdot 2^3 = 2^5$

$2 \cdot 2 \cdot 2 \cdot 2 \cdot 2 = 2^5$

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

Ex: $(2^3)^4 = 2^{12}$

$(2^3)(2^3)(2^3)(2^3)$

Alanah

$\frac{q^m}{q^n} = q^{m-n}$

Ex $\frac{2^4}{2^2} = 2^{4-2} = 2^2$

$\frac{2 \cdot 2 \cdot 2 \cdot 2}{2 \cdot 2} = 2 \cdot 2 = 2^2$

$q^{-m} = \frac{1}{q^m}$

Ex $3^{-5} = \frac{1}{3^5}$

$\frac{1}{2^{-3}} = 2^3$

$\frac{x^3 y^2 z^{-2}}{x^2 y^{-3}}$

$\frac{x^3 y^2 y^3}{x^2 z^2}$

$\frac{x^3 x^{-2} y^5}{z^2} = \frac{x y^5}{z^2}$

Solving Basic Exponential Functions

- To solve Exp. Functions

  We want the Base to be the same.

- When the Bases are the same you can cancel the bases and set the Exponents equal!

Ex: $2^x = 2^4$ ← Exponent

Base

$2^x = 16$

$2^x = 2^4$

$x = 4$

$2^{x+2} = 2^4$

$x+2 = 4$

$-2 \quad -2$

$x = 2$

$3^{5x-3} = 3^{2x}$

$5x-3 = 2x$

$-2x \quad -2x$

$3x-3 = 0$

$+3 \quad +3$

$\frac{3x}{3} = \frac{3}{3}$

$x = 1$

$8^{3x} = 2$

$(2^3)^{3x} = 2$

$2^{9x} = 2^1$

$9x = 1$

$\frac{9x}{9} = \frac{1}{9}$

$x = \frac{1}{9}$

$8^{3(\frac{1}{9})} = 2$

$8^{\frac{1}{3}} = 2$

$\sqrt[3]{8} = 2$

$2 = 2$

$8 = 2^3$

$x = 1x$

$2 = 2^1$

Worksheet for Nov 16th

1) $5^{3-2x} = 5^{-x}$

2) $3^{2x} = 3^{-x}$

3) $6^{-2x} = 6^{2-3x}$

4) $2^{2x+2} = 2^{3x}$

5) $3^{1-2x} = 243$

6) $16^{2p-3} \cdot 4^{-2p} = 2^{4}$