U4D3 MCR3UI **Solving Exponential Equations**

Warm Up:

Simplify.

a) $3^x \cdot 3^4$

b) $\sqrt{\sqrt[5]{x^4y^6}}$

Solving Exponential Equations

Method 1: Using a common base
If there is a _____ base, you can _____ the exponents. This gives a linear equation that you can _____.

a) $4^x = 4^5$

b) $2^{x+3} = 2^{2x-1}$

Method 1 con't: If the bases are NOT the _____, you can either make them the same OR
Method 2: you can use a _____ to figure out the value of the unknown (trial and error).

c) $3^x = 27$

d) $4^{3k} = 64$

Method 1:

Method 2:

e) $4^x = 8^{x-1}$

Method 1: Method 2:

Examples Involving Rationals:

a) $3^{3x-1} = \frac{1}{81}$ b) $27(3^{3x+1}) = 9$ c) $2(5^{k+1}) = 1250$

Example Involving Common Factor:

$3^{x+2} - 3^x = 216$