

**Objective:** To solve exponential equations with common bases

**Warm Up:** Fill in the blanks with the missing value to make the statement true.

$$3^{\square} = 81$$

$$2^{\square} = 32$$

$$4^{\square} = 64$$

**Example 1:** *Simplifying Exponential Expressions*

\*The key is making all bases the same so that exponent properties hold\*

A.)  $\frac{8^{x-1}}{2^x}$

B.)  $7^{2x} * 49^{x-4}$

C.)  $3^x * 27 * 3^{x-1} * \left(\frac{1}{9}\right)^{2x-1}$

**Example 2:** *Solving Exponential Equations*

\*The key is making the left side and right side have the same base. Once they look the same, then the exponents form their own equation\*

A.)  $4^x = 4^{2x+1}$

B.)  $3^{2x} = 3^{x-5}$

C.)  $7^{3x-3} = 7^{x+22}$

D.)  $27^x = 9^{x-3}$

E.)  $2^{4x} = 32^{x-1}$

F.)  $2^{x+1} = 8^{3x-2}$

G.)  $25^{x^2} = 5^{x+3}$

H.)  $125^{x^2} = 5^{-7x-2}$