

Name: _____

Date: _____

Learning Goal 7.2Solving equations with same base and with different bases, including base e .**Example** Write each expression without brackets and with positive exponents.

a.
$$\frac{24m^5p^{-3}q^4}{-4m^4p^2q^{-2}}$$

b.
$$\left(\frac{18x^{-2}y^3}{54x^{-6}y^{-1}}\right)^3 \div \frac{(6x^2y^{-3})^{-2}}{(x^{-4}y^2)^3}$$

Example Convert each of the following to the base indicated.

a. 32^x to base 2

b. 81^{x-2} to base 3

c. $\frac{1}{64^{2x}}$ to base 4

Example Simplify the following by converting each term to a common base.

a.
$$\frac{8^{3x-4} \cdot 16^{4-x}}{64^{1-2x}}$$

b. $(9^{2x+3} \div 27^{3x-1}) \cdot 81^{x-1}$

Definition An exponential equation is an equation where the variable appears in the exponent.

(For now, we are only solving **exponential equations with the same base** using algebraic methods)

Example Solve and check.

a. $2^{(4x-1)} = 8^{2x}$

b. $27^{x-4} = \left(\frac{1}{9}\right)^{2x-8}$

Steps

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Example A population of ants starts with 4000. After 4 weeks the estimated count is 128000 ants in the colony. What is the doubling period for this population?