

Lesson 2 Solving Exponential Equations

Review Exponent Laws

$$x^n \cdot x^m =$$

$$\frac{x^n}{x^m} =$$

$$(x^n)^m =$$

$$\left(\frac{x}{y}\right)^n =$$

$$x^0 =$$

$$x^{-n} =$$

$$x^{n/m} =$$

Steps to solve an exponential equation:

1. If the bases are the same (one base on each side) use one-to-one property;
 - equate the exponents and solve
 - If $b^m = b^n$, then $m = n$
2. If bases are different;
 - rewrite with a common base
 - equate the exponents and solve

Ex. 1) Solve for x .

a) $2^{5x-1} = 16$

b) $4^{x+2} \cdot 64^x = 1$

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c) $3^x(27) = 81^{2x+1}$

d) $2^{3x} \cdot 4^{x-1} = \left(\frac{1}{8}\right)^{x+2}$

e) $4^{x+1} = 2^x\sqrt{2}$

f) $\left(\frac{1}{2}\right)^{-x^2} = 8^{2x-3}$

To solve for a missing base, raise both sides of the equation to the reciprocal power of the given exponent.

Ex. 2) Solve.

a.) $b^4 = 16$

b.) $b^{\frac{2}{3}} = 9$