


## Solving Exponential Equations Class Work

 **Objective:** *You will be able to solve exponential equations.*

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### ★ Equivalence of Exponents

**Example 1:** Solve for x.

$$11^{3x} = 11^{(5x + 12)}$$

**Example 2:** Solve for x.

$$9^{(x - 4)} = 27^{(3x - 8)}$$

 **Practice:** Solve for the variable in each equation.

1.  $4^{-2w} = 16^{(w - 9)}$

2.  $15^{(x + 2)} = 15^{3(-x + 12)}$

3.  $8^r = \frac{1}{2}^{(2r + 4)}$

4.  $5^{(s - 1)} = 25^{(s - 3)}$

What if you have an equation like  $4^x = 7$ ?


★ **Logarithms to the Rescue!**

**Example 3:** Solve for x.

$$4^x = 7$$

**Example 4:** Solve for x.

$$2 + 3(2)^{x-3} = 29$$

 **Practice:** Solve for the variable in each equation. Be sure to check for extraneous solutions.

5.  $3^{-2h} = 16$

6.  $5 - 6e^{s+2} = -25$

7.  $3 + (8)3^{-x} = 11$

8.  $1 - 3e^{2y-9} = -26$

9.  $8^m = 3^{m-2}$

10.  $2^{n+1} = 3^{7n}$

11.  $\frac{3}{5}e^{4x} + \frac{3}{2} = 10$

12.  $\frac{1}{3}e^{9x} - \frac{9}{2} = -2$

**Exit Slip: Solve for the variable in each equation.**

1.  $\frac{1}{2}^{2x} = 16^{(x+1)}$

2.  $18^{2x-7} = 5$

Homework:

p.456 – 459

#1 – 9 odd, and #79 – 95 odd