

Unit 7 Class Work

Solving Exponential Equations Class Work

Objective: You will be able to solve exponential equations. (only practice)

* Equivalence of Exponents

Example 1: Solve for x.
 $11^{3x} = 11^{5x+12}$
 If the bases are the same, the exponents are equal.
 $3x = 5x + 12$
 $-2x = 12 \Rightarrow x = -6$

Example 2: Solve for x.
 $3^{2x-4} = 3^{3x-8}$ *rewrite w/ common base 1st
 $2(x-4) = 3(3x-8)$ *set exponents
 $2x-8 = 9x-24$
 $-7x = -16 \Rightarrow x = 16/7$

Practice: Solve for the variable in each equation.

1. $4^{2w} = 16^{w-18}$
 $2w = 2(w-18)$
 $-4w = -18$
 $w = 9/2$

2. $15^{x+2} = 15^{3x+10}$
 $x+2 = 3(-x+12)$
 $x+2 = -3x+36$
 $4x = 34$
 $x = 34/4 = 17/2$

3. $8^r = 1/2^{2r+4}$
 $(2^3)^r = (2^{-1})^{2r+4}$
 $3r = -2r-4$
 $5r = -4$
 $r = -4/5$

4. $5^{s-1} = 5^{-2(s-3)}$
 $s-1 = 2s-6$
 $-s = -5$
 $s = 5$

HW

Solve each equation.

1. $93^{3x+2} = 93^{-4(x+5)}$

2. $36^{5x-1} = \left(\frac{1}{216}\right)^{3x}$

3. $343^{2x+7} = 49^{-4x-9}$

4. $32^{-(5x+3)} = \left(\frac{1}{2}\right)^8$

Solutions

1. $-22/2$

2. $2/19$

3. $-39/14$

4. $-7/25$