Solving Equations Involving Logarithms Class Work

Objective: *You will be able to solve equations involving logarithms.*

★ Property of Equality

Example 1: Solve for x.

$\log_{13}(2x - 5) = \log_{13}(3x + 1)$

Example 2: Solve for x.

$\log_3(3x) - \log_3 12 = \log_3(x - 2)$

Practice: Solve for the variable in each equation.

1. $\log_5(3z + 1) = \log_5(6z - 8)$

2. $\log_2(4w) - \log_2 8 = \log_2(6w - 1)$

3. $\log_7(y^2 - 2) = \log_7(2)$

4. $\ln(2x) + \ln(x - 3) = \ln 8$

Property of Equality: In general, if $\log_b x = \log_b y$, then _____!

★ **Logarithmic & Constant Equivalence**

Example 3: Solve for x. Be sure to always check for extraneous solutions.

$\log_2(2x) + \log_2(x - 1) = 4$

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

1. $\log_5(3p) + \log_5(2p + 4) = 2$

2. $\log(4w) + \log(w + 3) = 3$

3. $\log_9(y) + \log_9(y - 24) = 2$

4. $\log(100r) + \log(r - 15) = 4$

5. $\log_2(3x) - \log_2(x - 9) = -5$

6. $\log_4(2s) - \log_4(s + 1) = -1$

7. $\ln(4x + 3) = 3$

8. $\ln(x - 1)^2 = 9$

9. $\ln(2x + 3) = 7$

10. $\ln(2x - 3)^2 = 8$

Exit Slip: Solve for the variable in each equation.

1. $\ln(3x) + \ln(2x - 6) = \ln(60)$

2. $\log_3(2m) + \log_3(m + 6) = 3$

Homework:

~ Solve for the variable in these 5 problems.

1. $\log_3(2z - 9) = \log_3(4z + 9)$
2. $\log_2(8w) - \log_2 7 = \log_2(2w - 5)$
3. $\log_6(x^2 - 10) = \log_6(15)$
4. $\ln(3x) + \ln(x - 7) = \ln 3$
5. $\log_{15}(2c) + \log_{15}(c - 8) = \log_{15} 10$

~ pages 456-457 #33 – 47 odd

~ page 465 #15, 17, and 19

~ Throwback: page 460 #119, 121, 123, and 127