Solving Logarithmic Equations (Part 2)

These notes are intended as a summary of section 5.7 (p. 417 – 421) in your workbook. You should also read the section for more complete explanations and additional examples.

Solving Complex Logarithmic Equations

To solve a more complex logarithmic equation:

1. Use the laws of logarithms to simplify to a single logarithm.

2. Rewrite as an exponential equation and solve.

Note: In $y = \log_a x$, x must be positive. Negative answers are extraneous and should be disregarded.

Example (not in workbook)
Solve for x:

a) $\log_2(x-2) + \log_2 x = \log_2 3$

b) $\log_5(3x+1)+\log_5(x-3)=3$

c) $\log_2 x = \log_2(9-2x) - \log_2(x-2)$

Example 1 (sidebar p. 418)
Solve: $\log_3 9x + \log_3 x = 4$. Verify the solution.

Example 2 (sidebar p. 419)
Solve, then verify each equation.

a) $\log 6x = \log(x+6) + \log(x-1)$

b) $3 = \log_2(x+2) + \log_2 x$

Homework: #3, 4, 9, 11, 13 in the section 5.7 exercises (p. 422 – 427). Answers on p. 428.