

## Lesson 6 Solving Logarithmic Equations

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**Steps:**

1. Move all logs to one side and leave the constant (or 0) on other side. If all terms have logs, no need to isolate (see example 1).
2. Combine all logs into a single log using log laws.
3. Change to exponential form
4. Solve
5. Check your solution, extraneous roots may exist
  - Logs are only defined for positive (+) arguments, if a solution yields a negative (-) or 0 argument, reject that solution.

**Ex. 1)** Solve.

a)  $\log_3(2x) = \log_3(x + 5)$

b)  $\log_3(9x) + \log_3x = 4$

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

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

e)  $\ln(x + 1) = 1 + \ln x$

f)  $x^{\log x} = 100x$