Objective: Solve logarithmic equations using properties/rules of logarithms and a calculator

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The Principle of Logarithmic Equality

For any logarithmic base, b, and for any $x > 0$ and $y > 0$, $x = y$ is equivalent to $\log_b x = \log_b y$. In other words, two expressions are equal if and only if the logarithms of those expressions are equal.

In order to solve logarithmic functions, you will need a combination of the following skills:

- The principle of logarithmic equality
- Properties of logarithms
- Expanding/condensing logarithms
- Change of base formula (calculating log's with a calculator)

******Always check your solution. Check for extraneous solutions. Remember you cannot take the log/ln of 0 or a negative number

Examples: Solve the following equations.   Round to the nearest thousandth if necessary.

1. $\ln(30x + 2) = \ln(-2x + 66)$

2. $\log_4(x-5) = -1$

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

4. $50e^{0.035x} = 200$

5. $25^{2x+1} = 144$