5.6 Exponential and Logarithmic Equations

Steps for solving exponential equations

1. Isolate the power on one side of the equation.
2. Rewrite the equation in logarithmic form.
3. Evaluate the logarithm.
4. Solve for the variable.

Examples

Solve for x

1. $2e^{-x} = 8$
2. $100 - 5(10)^{x} = 7$
3. $e^{2x} = e^{5x-3}$
4. $30 - 3(0.75)^{x-1} = 29$

Steps for Solving Logarithmic Equations

1. Combine all logarithms using the properties of logarithms.
2. Isolate the logarithm on one side of the equation.
3. Rewrite the equation in exponential form.
4. Simplify and solve for the variable.
5. Check your answer!!! You may have answers that don't work.

Examples

Solve for x

1. $5\ln x = 10$
2. $\log_3(1-x) = 1$
3. $\log x^5 = 4 + 3\log x$
4. $\ln(x^2-4) - \ln(x+2) = \ln(3-x)$