Exponential Functions
Supplemental Instruction
Iowa State University

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Laws of exponents:
I. \( b^x \cdot b^y = \)
II. \( \frac{b^x}{b^y} = \)
III. \( (ab)^x = \)
IV. \( (b^x)^y = \)
V. \( \left(\frac{a}{b}\right)^x = \)

1. Describe the process for solving exponential equations with the same base.

2. Solve the following equations for \( x \)
   a. \( 3^{3x-4} = 3^5 \)
   b. \( 10^{2x-1} = 10^{x+3} \)
   c. \( 3^{2x} - 12 \cdot 3^x + 27 = 0 \)
   d. \( 3^{x-x^2} = \frac{1}{9^x} \)

3. A function \( f \) has the form \( f(x) = Ae^{kx} \) where \( A \) and \( k \) are constants. Find \( f \) if it is known that \( f(0)=100 \) and \( f(1)=120 \). Remember \( e^{kx} = (e^k)^x \)