

## Solving Logarithmic Equations

$$\begin{aligned} 1) \ln(x+5) &= 2 \\ e^2 &= x+5 \\ e^2 - 5 &= x \\ x &= 2.39 \end{aligned}$$

$$\begin{aligned} 2) \log_4(2x-1) &= 2 \\ 4^2 &= 2x-1 \\ 16 &= 2x-1 \\ 17 &= 2x \\ \frac{17}{2} &= x \end{aligned}$$

$$\begin{aligned} 3) \log_x 9 &= 2 \\ x^2 &= 9 \\ x &= 3 \end{aligned}$$

$$\begin{aligned} 4) \log x + \log(x-1) &= \log(4x) \\ \log(x(x-1)) &= \log(4x) \\ x(x-1) &= 4x \\ x^2 - x &= 4x \\ x^2 - 5x &= 0 \\ x(x-5) &= 0 \\ x &\neq 0 & x-5=0 \\ \text{extraneous} & \quad \boxed{x=5} \end{aligned}$$

