

LTA44

How do I solve Logarithmic equations? for x

1/10

$$e \approx 2.718$$

e = Euler

$$Pe^{rt}$$

Natural Log

$$\ln_e x = \ln x$$

$$1.) \ln 10 = \ln_e 10 \approx 2.30$$

$$2.) \ln x = 4$$

$$\ln_e x = 4$$

$$x = e^4 \approx 54.6$$

Ex 1:

$$\log(x) + \log 8 = 3$$

$$\log_{10}(8x) = 3$$

$$8x = 10^3$$

$$\frac{8x}{8} = \frac{1000}{8}$$

$$x = 125$$

1. Condense

2. Rewrite as exponential

3. Simplify exponent

4. Solve for x

$$\text{Ex 2: } \log_4 (x+30) - \log_4 (x) = 3$$

$$\log_4 \left(\frac{x+30}{x} \right) = 3 \quad \nearrow \uparrow$$

$$\frac{x+30}{x} = 4^3$$

$$\cancel{x} \cdot \frac{x+30}{\cancel{x}} = 64 \cdot x$$

$$\begin{array}{r} \cancel{x} + 30 = 64x \\ -\cancel{x} \qquad \quad -x \\ \hline \end{array}$$

$$\frac{30}{63} = \frac{63x}{63}$$

$$.48 \approx x$$