For a>0 and a 1, the following properties are true for all x and y for which $\log_a x$ and $\log_a y$ are defined:

$$a^{x} = a^{y} \text{ if and only if } x = y$$

$$\log_{a} x = \log_{a} y \text{ if and only if } x = y$$

$$a^{\log_{a} x} = x$$

$$\log_{a} a^{x} = x$$

$$\log_{a} a^{x} = x$$
Example: Apply basic strategies to solve:
$$Ex. \quad (3/4)^{x} = 64/27 \qquad \text{solve: } 4^{x} = 16 \qquad 7^{x} = 1/49 \qquad 8^{x} = 4$$

Ex.
$$\ln e^{5x} = 2$$
 solve: $\log_4 4^x = 3$ $\log 10^x = -1$

by raising both to a reciprocal power. $x^{2/3}=4$ Remember: when you take a "even" root that there are 2 roots...positive and negative Ex:

Solve: $x^{3/4} = 125$

______ factor and apply the zero product property. You will also need to apply a log (In) to both sides since x is a power

Solve: $e^{2x} + 5e^{x} - 14 = 0$

 $e^{2x} + 7e^{x} + 12 = 0$

when in log form rewrite as an exponent to see if the new form is solvable Solve: $\ln x = 2$ (isolate ln first) $2 \ln 3x = 4$ $3 + 2 \ln (2x-1) = 4$