Exponential and Logarithmic Equations:

The goal in solving exponential and logarithmic equations is to eventually remove the exponential and logarithmic parts.

$$b^x = b^y \Rightarrow x = y$$

$$log_b\, x = log_b\, y \Rightarrow x = y$$

$$log_b\left(b^x\right) = x; \text{for all } x$$

$$b^{log_b\, x} = x; \text{for } x > 0$$

Examples:

1. $log\left(x+6\right)=1$

2. $log_4\left(x+2\right)=log_4 8$

3. $log_4\left(x+2\right)=log_4\left(2x+7\right)$ **{Be careful!}**

4. $2log_5 x = 3log_5 4$

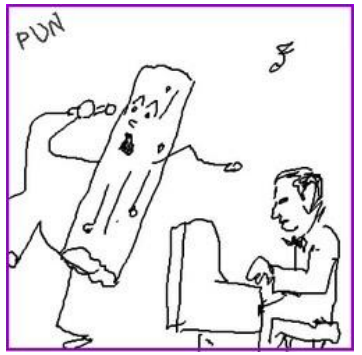
5. $log_6(x+4) + log_6(x+3) = 1$

6. $log_3 x - 2log_3 5 = log_3(x+1) - 2log_3 10$

7. $3^{2x} + 3^{x} - 2 = 0$

8. $2^{2x} + 2^{x+2} - 12 = 0$

9. $3^{1-2x} = 4^{x}$



10. $5^{2x} - 8 \cdot 5^{x} = -16$

11. $3^{x} - 14 \cdot 3^{-x} = 5$