Algebra II Name _____

Exp/Log #5

Solve the following equations. No Calculator.

1. $5^{x-3} = 25^{x-5}$

2. $6^{2x-6} = 36^{3x-5}$

3. $49^{5x+2} = \left(\frac{1}{7}\right)^{11-x}$

4. $512^{5x-1} = \left(\frac{1}{8}\right)^{-4-x}$

Solve the following equations. You may use a calculator if needed.

5. $3^{x} = 7$

6. $7^{5x} = 12$

7. $11^{6x} = 38$

8. $3e^{4x} + 9 = 15$

9. $\ln(4x - 7) = \ln(x + 11)$

10. $\log_2(4x + 8) = 5$

11. $\log(x + 1)^2 = 1$

12. $\ln(2m + 3) = 8$

13. Your family purchases a new car for $20,000. Its value decreases by 15% per year. During what interval does the car's value exceed $10,000?

14. For the following use Newton's Law of Cooling:
$T = (T_0 - T_R)e^{-rt} + T_R$, the temperature T after t minutes. Where T_0 is the initial temperature, T_R is the surrounding temperature and r is the cooling rate of the substance.

You cook a turkey until the internal temperature reaches 180ºF. The turkey is placed on the table until the internal temperature reaches 100ºF and it can be carved. When the room temperature is 72ºF, the cooling rate of the turkey is r = 0.067. How long do you have to wait until you can carve the turkey?