# MAT – 112: Calculus I and Modeling

## Group Work: Exponentials and Logarithms

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**Instructions**

Below you will find three rounds of four problems. For every round, each group member attempts one problem (if you only have three members then skip the last problem in the round). Once you are finished with a problem you may help the other members in your group. Once your group is done with the round, move on to the next round.

**Round 1.** Solve for $x$, leave your answer in exact simplified form.

1. $2^{3x} = 256$
2. $3^{2x} = 81$
3. $5\left(2^{9x}\right) - 3 = 37$
4. $7^x = 4^{2x-1}$

**Round 2.** Solve for $x$, leave your answer in exact simplified form.

1. $-14 + 3e^{x-4} = 11$
2. $e^{2x} = 80$
3. $\log_x 625 = 4$
4. $\ln x = -3$

**Round 3.** Solve for $x$, leave your answer in exact simplified form. In these problems you must check that your answer makes sense.

1. $e^{2x} - 4e^x - 5 = 0$
   *Hint: make a substitution to transform to an equation you can solve.*
2. $\ln x + \ln(2x + 1) = 0$
3. $\log_4 x - \log_4(x - 1) = \frac{1}{2}$
4. $\ln(x - 1) + \ln(x - 3) = 2\ln x$