MAKING SENSE OF MATHEMATICS

After watching the video, Solving for Exponents, complete the following problems.

1. Estimate a solution for $5^{x}=3^{2 x+1}$ using a graph. Then, solve using symbolic reasoning.
2. According to data from the U.S. Department of Agriculture, beef consumption in the United States (in billions of pounds) x years after 1900 can be approximated by $-154.41+90.68 \log x$.
a) According to this model, how much beef was consumed in 2000?
b) According to this model, when will beef consumption reach 50 billion pounds per year?
3. The following is a graph of $x$ versus $\log _{b} x$. What is the value of $b$ ? How do you know?

4. Find the value of $b$ given the following table of values. You don't need a calculator to find it!

| $\mathbf{x}$ | $\boldsymbol{\operatorname { l o g }}_{\mathbf{b}} \mathbf{x}$ |
| :---: | :---: |
| 1 | 0 |
| 18 | 1.6131 |
| 36 | 2.0000 |
| 50 | 2.1833 |

5. Solve the following equation: $10^{x^{2}-3 x+6}=10,000$
6. Solve the following equation: $10^{3 x+2}=10^{5}$
