

Show all work, including mental steps, in a clearly organized way that speaks for itself. Use proper mathematical notation, identifying expressions by their proper symbols (introducing them if necessary), and use arrows and equal signs when appropriate. Always simplify expressions. BOX final short answers. LABEL parts of problem. Keep answers EXACT (not decimal approximations, if possible).

If a bacteria population starts with 100 bacteria and doubles every three hours, then the number of bacteria after t hours is $n = f(t) = 100 \cdot 2^{t/3}$.

- Find the inverse of this function and explain its meaning in a complete English sentence.
- When will the population reach 50,000? Give the exact formula and the decimal approximation to 3 significant figures, with units.
- Make a completely labeled graph that illustrates all of this information.