A bacterium grows with constant relative growth rate. After 2 hours there are 600 bacteria and after 8 hours the count is 75,000.

1. State the general form for the solution.

\[ Y = Y_0 e^{kt} \]

2. From the general form, write out the two equations for the two data points you are given.

a. 

b. 

3. Choose one equation and solve for \( Y_0 \) in terms of \( k \).

Example: \( Y_0 = \frac{600}{e^{2k}} \)
4. Plug the solution for $Y_0$ back into the other equation and solve for $k$.

5. Using the first equation and your value for $k$, solve for $Y_0$.

After simplifying, you should get $Y_0 = 120$ and $k = \frac{\ln 12.5}{6} \approx 0.80472$

6. Using $Y_0$ and $k$ find $Y(t)$ for $t$ in hours.