Final

$$\ln I_{(t)} = \ln I_{(0)} + kt$$

$$\ln I_{(t)} = \ln I_{(0)} + \left(\frac{B S_o}{N} - r \right) t$$

$$\ln I_{(t)} = \ln I_{(0)} + \left(\frac{B \, 990}{1000} - .1 \right) t$$

$$k = \frac{990 B}{1000} - .1$$

$$k = a_1$$

$$a_1 = \frac{990 B}{1000} - .1$$

$$\boxed{\begin{array}{c} B = \dfrac{1000 \, a_1 + .1}{990} \\[2mm] I_0 = e^{a_0} \end{array}}$$

Blueprint for Code.
1. I converted the Infected values by ln
2. I ran the code based off these a values
3. Converted the a0 value into I0 by putting it into an exponential

Write q=ln(y), x unchanged, a_0=ln(α), a_1=β, and use

$$a_1 = \frac{n \sum\limits_{i=1}^{n} x_i q_i - \sum\limits_{i=1}^{n} x_i \sum\limits_{i=1}^{n} q_i}{n \sum\limits_{i=1}^{n} x_i^2 - \left(\sum\limits_{i=1}^{n} x_i \right)^2}$$

$$a_0 = \frac{1}{n} \sum\limits_{i=1}^{n} q_i - a_1 \frac{1}{n} \sum\limits_{i=1}^{n} x_i$$

Then don't forget to re-define: β=a_1, α=e^{a0}