80. If the solenoid is long and thin, then when it is bent into a toroid $(b-a)/a$ is much less than 1. Therefore,

$$L_{\text{toroid}} = \frac{\mu_0 N^2 h}{2\pi} \ln\left(\frac{b}{a}\right) = \frac{\mu_0 N^2 h}{2\pi} \ln\left(1 + \frac{b-a}{b}\right) \approx \frac{\mu_0 N^2 h(b-a)}{2\pi b} .$$

Since $A = h(b-a)$ is the cross-sectional area and $l = 2\pi b$ is the length of the toroid, we may rewrite this expression for the toroid self-inductance as

$$\frac{L_{\text{toroid}}}{l} \approx \frac{\mu_0 N^2 A}{l^2} = \mu_0 n^2 A ,$$

which indeed reduces to that of a long solenoid. Note that the approximation $\ln(1+x) \approx x$ is used for very small $|x|$.