Assignment 08: Must Be Easy

1. We know that we can model the collector current, I_C, of a BJT as:

$$I_C = I_S \, \mathrm{e}^{\frac{V_{BE}}{V_T}} \tag{1}$$

   where

$$I_S = \frac{A_E q D_n n_i^2}{N_B W_B}. \tag{2}$$

   Solve for the cross section area, A_E, in terms of I_C.

2. We know that we can model the voltage of an RC circuit with the following differential equation:

$$V_S(t) = RC\frac{dV_C(t)}{dt} + V_C(t). \tag{3}$$

   Use `dsolve()` to solve this differential equation.

3. Evaluate $\mu_0 = 4\pi \times 10^{-7}$ to $\lfloor 1000\pi \rfloor$ decimal places.

   Hint: Convert 4×10^{-7} to a symbolic value with `sym()`.

