Newton's Law of Cooling:

\[
\frac{dT}{dt} = -A(T - T_0)
\]

a) \( A \) will depend on Area of Contact between hot & cold objects. Their masses & specific heats:

\[ [A] = [T][Time] \quad (Dimensions) \]

b) Newton's Law of Cooling is a Differential Equation:

Solution is of form:

\[ \Delta T = C_1 e^{-C_2 t} \]

Plugging this into law:

\[-C_1 C_2 e^{-C_2 t} = -A C_1 e^{-C_2 t} \]

\[ C_2 = \frac{A}{C_2} \]

At \( t = 0 \), \( \Delta T = \Delta T_0 = C_1 \)

\[ \therefore \quad \Delta T_0 = C_1 e^{-At} \quad \text{QED} \]