

# Physical World 2D Report

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## I. DERIVATION

$$T_i - T_{amb} = -R\rho V c \frac{dT}{dt}$$

$$\int_0^t dt = -R\rho V c \int_{T_i}^T \frac{1}{T - T_{amb}} dT$$

$$\frac{t}{R\rho V c} = \ln \left| \frac{T - T_{amb}}{T_i - T_{amb}} \right|$$

$$(T_i - T_{amb}) e^{-\frac{t}{R\rho V c}} = T - T_{amb}$$

$$\Delta T = \Delta T_{initial} e^{-\frac{t}{R\rho V c}}$$