

The Cooling/Heating Problem

Consider a can of coke that has been sitting in the fridge for several days. The temperature in the fridge is 5 degrees C. How long will it take for the coke to reach room temperature (21 degrees C) after you take it out of the fridge?

Newton's Law of Cooling (Heating) says:

The rate at which heat is lost from (gained by) an object is proportional to the difference between the temperature of the object and the ambient temperature.

Develop a model (differential equation) that describes the temperature of the object as a function of time.