Some applications:

Newton's Law of Cooling / Heating

Principle:
The rate of change of the temperature of a body is proportional to the difference between its Temp. and the temp. of the surrounding medium

That is, if

$T(t) :=$ Temp. of the body at time t;

$T_m :=$ Temp. of the surrounding medium

Then

$$\frac{dT}{dt} \propto T - T_m$$

$$\frac{dT}{dt} = K(T - T_m), \qquad K \text{ constant}$$

From which we obtain,

$$\boxed{T(t) = T_m + Ce^{kt}}$$

Consider the following example:

Example

A small metal bar, whose initial temperature was 20º C, is dropped into a large container of boiling water. How long will it take the bar to reach 90º C if it is known that its temperature increases 2º in one second?