

$$\frac{dT}{dt} = K(T-25)$$

$$\frac{dT}{T-25} = K dt$$

$$(T-25)$$

$$\ln(T-25) = Kt + c$$

$$\ln(T-25)$$

$$T-25 = e^{Kt+c}$$

$$T-25 = e^{Kt} T_0$$

$$T = T_0 e^{Kt} + 25$$

$$\text{at } t=0$$

$$10 = T_0 e^{K(0)} + 25$$

$$10 = T_0 + 25$$

$$T_0 = 10 - 25 = -15$$

$$T = -15e^{Kt} + 25$$

after 5 minutes

$$T = 20, t = 5$$

$$20 = -15e^{Kt} + 25$$

$$20 - 25 = -15e^{Kt}$$

$$-5 = -15e^{Kt}$$

$$\frac{-5}{-15} = \frac{-15}{-15} e^{Kt}$$

$$\ln 0.33 = \ln e^{Kt}$$

$$\frac{-1.10}{5} = \frac{5K}{5}$$

$$K = -0.222$$

$$T = -15e^{-0.222t} + 25$$