Temp. rom = 20,2°C

tid:	Temp. °C
(0 min) 0 s	83,4
(1 min) 60 s	74,2
(2 min) 120 s	72.0
(3 min) 180 s	66,9
(4 min) 240 s	63,9
(5 min) 300 s	61,2
(6 min) 360 s	58,0
(7 min) 420 s	56,4
(8 min) 480 s	54,7
(9 min) 540 s	52,7
(10 min) 600 s	51,7

$$\dot{T} = \frac{51,7 - 83,4}{600} = -0,05283\ K/s$$

$$\dot{T} = \alpha(T - T_K) \qquad T_K = 20,2°C$$

$$\dot{T} = \alpha T - T_K$$

$$\dot{T} - \alpha T = T_K \quad | \cdot e^{-\alpha t}$$

$$\dot{T} \cdot e^{-\alpha t} - \alpha T e^{-\alpha t} = T_K \cdot e^{-\alpha t}$$

$$\left(T e^{-\alpha t}\right)' = \dot{T} \cdot e^{-\alpha t} + (-\alpha) T e^{-\alpha t}$$

$$T e^{-\alpha t} = T_K \cdot e^{-\alpha t} + C$$

$$T(t) = C \cdot e^{\alpha t} + T_K$$

$$T(0) = 83,4$$

$$C = 83,4 - T_K = 63,2$$

$$T(600) = 63,2 \cdot e^{\alpha \cdot 600} + 20,2 = 51,7$$

$$63,2 \cdot e^{600\alpha} = 31,5$$

$$e^{600\alpha} = \frac{31,5}{63,2}$$

$$600\alpha = \ln \frac{31,5}{63,2}$$

$$\alpha = \frac{\ln\left(\frac{31,5}{63,2}\right)}{600}$$

$$\alpha = -1,1605 \cdot 10^{-3}$$

$$T(t) = 63,2 \cdot e^{\alpha \cdot t} + 20,2 = y$$

$$63,2 \cdot e^{\alpha t} = y - 20,2$$

$$e^{\alpha t} = \frac{y - 20,2}{63,2}$$

$$\alpha = \frac{\ln\left(\frac{y - 20,2}{63,2}\right)}{t}$$

↓

Formelen for α, dvs y er temperaturen i vannet ved tiden t.