A) first define the cooling law:

$$T' = \alpha\,(T_{env} - T)$$

first room	second room
$T(0) = 70$	$T(0) = 40$
$T_{env} = 20$	$T_{env} = W$
$T(10) = 40$	$T(10) = 70$

i) $T' = \alpha\,(20 - T)$

$\Rightarrow$ Maple: $T(t) = 20 + 50\,e^{-\alpha t}$

$\rightarrow$ now use $T(10)$ to get α $\Rightarrow$ $40 = 20 + 50 \cdot e^{-\alpha \cdot 10}$

$\Leftrightarrow$ $\alpha = 0{,}091$

Dann $T(t) = 20 + 50\,e^{-0{,}091\,t}$

ii) $T' = \alpha\,(W - T)$

$\rightarrow T(t) = W + e^{-\alpha t}\,(40 - W)$

use $T(10)$ to calculate W: $T(10) = 70 = W + e^{-\alpha 10}\,(40 - W)$

$\Leftrightarrow$ $W = 90$