ii) $L(t)$ is increasing at a decreasing rate

iii) $\frac{dL}{dt} = kL$

$k > 0$ because the temperature $L(t)$ is still increasing.

iv) the difference in temperatures is described by

$\frac{dD}{dt} = kD$, so $D(t) = Ce^{kt}$

@ $t=0$, difference $= 25°$

$D(0) = 25 = Ce^{0t} \Rightarrow C = 25$

$L(t) = 65 - (\text{difference in temps})$

$= 65 - 25e^{kt}$

@ $t = 15$, temperature $L(15) = 50$

$50 = 65 - 25e^{k(15)}$

$-15 = -25e^{15k}$

$\frac{3}{5} = e^{15k}$

$\ln 3/5 = 15k \Rightarrow k = -0.034$

$\therefore \boxed{L(t) = 65 - 25e^{-0.034t}}$

v) $L(t) = 55 = 65 - 25e^{-0.034t}$

$\boxed{t = 26.9 \text{ min}}$