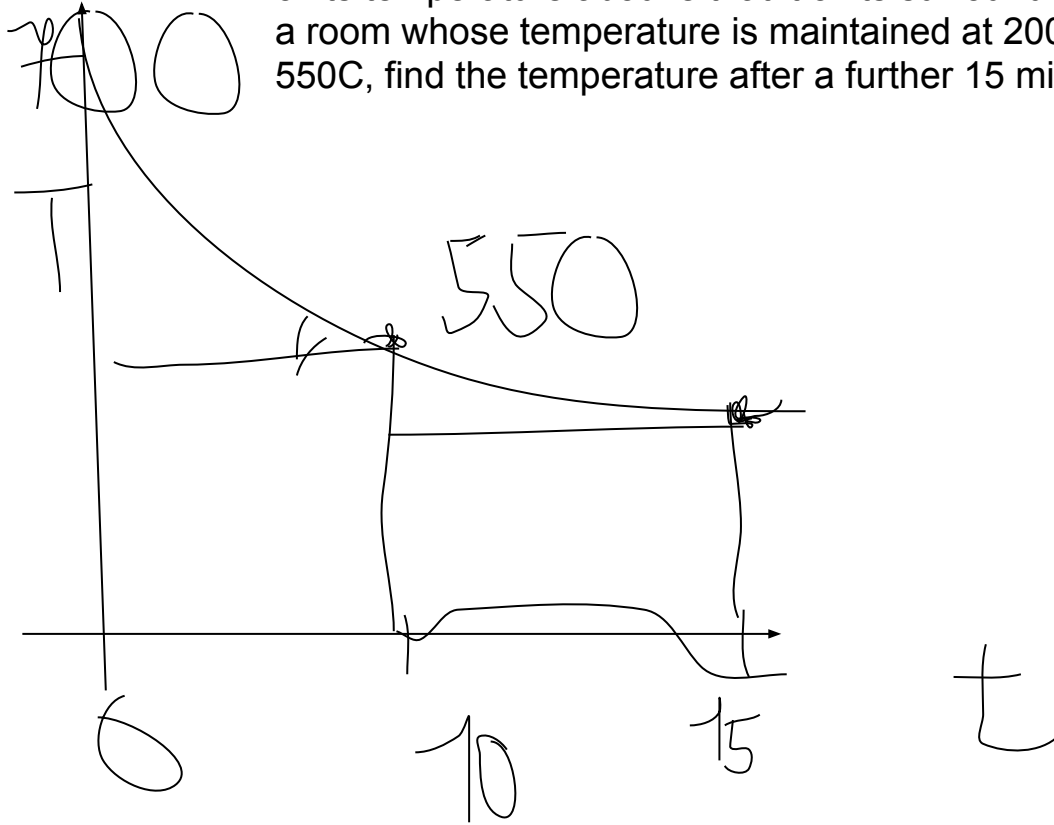Newton's Law of cooling states that the rate of cooling of a body is proportional to the excess of its temperature abouve that it of its surroundings. A body at a temperature 700C is placed in a room whose temperature is maintained at 200C. If, after 10 min, the temperature of the body is 550C, find the temperature after a further 15 min.

Newton's Law of Cooling

$$T(t) = T_s + (T_0 - T_s)e^{-kt}$$

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

T(t)=Ts+(T0-Ts)e^-kt
T'(t)=-k(T0-Ts)e^-kt
dT/dt=-k(T-Ts)
1/(T-Ts)dT=-kdt
S1/(T-Ts)dT=S-kdt
ln|T-Ts|=-kt+C
ln|700-550|=0+C
c=ln|150|
ln|550-Ts|=-15k+ln|150|
e^(ln|550-Ts|)=e^(-15k+ln|150|)
Ts=-e^(-15k+ln|150|)+550