F-LE Comparing Exponentials

Task

a. Lincoln deposits money in a Certificate of Deposit account. The balance (in dollars) in his account t years after making the deposit is given by $L(t) = 500(1.05)^t$ for $t \geq 0$. Explain, in terms of the structure of the expression for $L(t)$, why Lincoln's balance can never be 499.

b. Helen deposits money in a similar Certificate of Deposit account. The balance in her account is described, with units as in Lincoln's deposit, $H(t) = 600(1.04)^t$ for $t \geq 0$. Use the structure of the expressions for $L(t)$ and $H(t)$ to describe how the two balances compare over time.

c. By what percent does the value of $L(t)$ grow each year? What about $H(t)$? Explain.

d. During which year does Lincoln's balance to "catch up" with Helen's? Show your work.