M1100

4.3 #77

relative rate $= \dfrac{R'(t_0)}{R(t_0)}$ and $R'(t_0) = E'(t_0) + T'(t_0)$ since $R(t) = E(t) + T(t)$

We can model this growth as exponential, i.e.

$E(t) = 11e^{0.09t}$ $\quad T(t) = 8e^{-0.02t}$ where $t_0 = 0$.

So $T(0) = 8$ & $E(0) = 11$

$\Rightarrow E'(t) = 0.99e^{0.09t}$ $\quad T'(t) = -0.16e^{-0.02t}$

$\Rightarrow R'(t) = 0.99e^{0.09t} + -0.16e^{-0.02t}$

$R'(t_0) = R'(0) = 0.99 + -0.16 = 0.83$

$\Rightarrow \dfrac{R'(t_0)}{R(t_0)} = \dfrac{0.83}{E(t_0) + T(t_0)} = \dfrac{0.83}{11 + 8} = \dfrac{0.83}{19} \simeq 0.04368$