1. For a parameter $P > 0$, find an explicit general solution of
\[
\frac{dx}{dt} = P - \frac{x}{2}.
\]

2. A pot of tapioca pudding is taken off the stove at a temperature of $T_0$ and set to cool in a room of temperature $R$. The temperature of pudding can be modeled by the equation
\[
T' = k(R - T) \tag{1}
\]
where $k > 0$ is a constant. Verify that
\[
T(t) = R - (R - T_0)e^{-kt} \tag{2}
\]
solves equation (1) with initial condition $T(0) = T_0$. In other words,
(a) verify (2) satisfies $T(0) = T_0$, and
(b) verify that (2) satisfies (1).