Problem 37 in Section 1.4. Upon the birth of their first child, a couple deposited 5000 in an account that pays 8% interest compounded continuously. The interest payments are allowed to accumulate. How much will the account contain on the child's eighteenth birthday.

Solution. Let $A(t)$ be the amount of money in the account at time t. Measure A in dollars and t in years. The rate of growth of A is proportional to A. That is $\frac{dA}{dt} = kA$. In this problem $k = .08$. We are told $A(0) = 5000$. We want $A(18)$.

Solve the Initial Value Problem to get $A(t) = 5000e^{.08t}$. Plug in $t = 18$:

$$\boxed{A(18) = 5000e^{.08(18)}}.$$