

Section 5.1b Exponential Functions

Objective 4: Solving Applications of Exponential Functions

The **Periodic Compound Interest Formula** is $A = P\left(1 + \frac{r}{n}\right)^{nt}$, where A is the total amount in the account after t years, P is the principal (original investment amount), r is the annual interest rate as a decimal, and n is the number of times interest is compounded per year.

The **Continuous Compound Interest Formula** is $A = Pe^{rt}$, where A is the total amount in the account after t years, P is the principal (original investment amount), and r is the annual interest rate as a decimal.

Uninhibited Exponential Growth Model

The **uninhibited exponential growth model** is used when a population grows at a rate proportional to the size of its population and continues to grow without any limiting factors.

This model that describes the population, P , after a certain time, t , is $P(t) = P_0 e^{kt}$ where $P_0 = P(0)$ is the initial population and $k > 0$ is a constant called the **relative growth rate**. (Note: k may be given as a percent.)

