

Precalc 11.3

Use the exponential function $y=e^x$

exponential change

growth

decay

irrational

e

compound interest

continuously compounded interest

activity: Newton's law of cooling

Quiz 11.1-11.2

Exponential
Growth or
Decay
(in terms of e)

$N = N_0 e^{kt}$, where N is the final amount, N_0 is the initial amount, k is a constant and t is time.

3. Describe a situation that could be modeled by the equation $A = 3000e^{0.055t}$.

- 6. Demographics** Bakersfield, California was founded in 1859 when Colonel Thomas Baker planted ten acres of alfalfa for travelers going from Visalia to Los Angeles to feed their animals. The city's population can be modeled by the equation $y = 33,430e^{0.0397t}$, where t is the number of years since 1950.
- Has Bakersfield experienced growth or decline in population?
 - What was Bakersfield's population in 1950?
 - Find the projected population of Bakersfield in 2010.

EXERCISES

8. **Psychology** Without further study, as time passes you forget things you have learned. The Ebbinghaus model of human memory gives the percent p of acquired knowledge that a person retains after t weeks. The formula is $p = (100 - a)e^{-bt} + a$, where a and b vary from one person to another. If $a = 18$ and $b = 0.6$ for a certain student, how much information will the student retain two weeks after learning a new topic?