

5. The formula $A = 90e^{0.061t}$ models the population of a particular city, in thousands, t years after 2000. When will the population of the city reach 150 thousand? Round to the nearest year.
6. John bought a new car for \$30,000. After two years, the value of the car depreciated so that it was only worth \$20,000. If the value of the care each year decreases exponentially, then how much will the car be worth in another 5 years to the nearest dollar?
7. There were 80 dodos living on an island. After five years, the number of dodos decreased to 55. The number of dodos alive each year decreased exponentially. How many more years (to the nearest year) was it before there were just two dodos left on the island?

8. A scientist started with a culture of 10 bacteria in a dish. The number of bacteria at the end of each successive minute increased exponentially so that the number at the end of one hour was 500 bacteria. How many hours, to the nearest hour, from the start of the experiment passed before there were 1,000,000 bacteria?
9. During its exponential growth phase, a certain bacterium can grow from 5,000 cells to 12,000 cells in 10 hours. At this rate, how long will it take to grow to 50,000 cells? Round to the nearest hour.
10. A certain isotope has a half-life of 4.2 days. How long will it take a 150-milligram sample to decay so that only 10 milligrams are left? Round to the nearest day.
11. Find the accumulated amount of an investment of \$9000 at 1.1% compounded monthly for 6 years.

12. Suppose that you have \$6000 to invest. Which investment yields the greater return over 4 years: 1.25% compounded quarterly or 1.3% compounded continuously?

1. 22 grams
- 2a. $A = 500e^{.9242t}$, b. 20,159 bacteria
3. 500 rabbits
4. 5,660 people
5. 2008
6. \$7,259
7. 44 years
8. 3 hours
9. 26 hours
10. 16 days
11. \$9613.75
12. 1.3% compounded continuously