

[application of exponents]

1. A colony of birds triples every 15 years. If there are 300 birds in the colony now, how many will there be after 45 years?
2. What amount of money invested at 8% compounded annually will grow to \$500 in 5 years?
3. The half-life of palladium is 4 days. After 16 days, a sample of palladium has been reduced to 0.75 g. What was the initial mass of the sample?
4. During the 20th century, the population of Canada has been growing at the rate of 1.85% per year. If the population in 1981 was 24.1 million, what will the population be in the year 2000.
5. A Chevy worth \$20 500 depreciates at 21% per year, while a Ford worth \$24 500 depreciates at 24% per year. Which car is worth more after 5 years? How much?
6. Your aunt gave you a \$400 bond for Christmas. If the bond earn 8% compounded annually what will the bond be worth when it matures in 3 years?
7. A bacteria culture starts with 3 000 bacteria/ After 3 hours the count is 4 800. What is the doubling period?
8. Sodium-24 has a half-life of 15 h. Find the amount remaining from a 4 g sample after 7.5 h.
9. How long will it take \$1000 to grow to \$1500 at a rate of 9% per year, compounded quarterly?
10. Jacques bought a new car for \$15 000. Each year it depreciates by 30%. In how many years will the car be worth \$500>
11. A culture has 7 500 bacteria. The number doubles every 5 h. How many bacteria will there be in the culture after 12 h?
12. In 1626 Manhattan Island was sold for \$24. If that money had been invested at 4% per year, compounded semi-annually, what would it have amounted to today?
13. The world's population is doubling every 35 years. In 1980 the population was 4.5 billion. What was the world's population in 1910?
14. Find the amount if you deposit \$250 at 6.5% per year compounded semi-annually for 5 years.
15. After 30 h a sample of plutonium has decayed to $\frac{1}{64}$ of its original mass. Find the half life?
16. I want to buy a new computer in 4 years. I estimate my new system will cost \$2 500. How much must I invest now at 6% per year compounded monthly to be able to purchase this system?
17. There are 5 400 red ants in a colony. If there were 1 200 ants 8 years ago, what is the yearly rate of growth?