

Math Xb Spring 2004
Worksheet: Applications of Geometric Sums and Series
February 27, 2004

1. Amanda, at the young age of 9, has decided that she wants to be a doctor when she grows up. Her parents decide to set aside enough money in a bank account right now so that they will be able to withdraw \$10,000 every year for eight years beginning nine years from today. How much money should they put into an account with an annual interest rate of 6% compounded quarterly in order to do so?
2. Suppose you borrow some money at an interest rate of 6% compounded monthly. You begin paying back the money one year from today and make payments annually. You pay back the entire debt after 30 payments of \$1,000 each. How much money did you borrow?
3. In a pest eradication program, N sterilized male flies are released into the general population each day. It is estimated that 90% of these flies will survive a given day. If the long-range goal of the program is to keep 20,000 sterilized male flies in the population, how many flies should be released each day?
4. A certain drug has a half-life of about 2 hours in the bloodstream. The drug is formulated to be administered in doses of D milligrams every 4 hours. A level of more than 500 milligrams of the drug in the bloodstream is considered to be dangerous. Find the largest possible dose that can be given repeatedly over a long period of time.
5. A rubber ball is dropped from a height of 60 feet. If it rebounds approximately two-thirds the distance after each fall, find the total distance the ball travels.
6. The bob of a pendulum swings through an arc 24 centimeters long on its first swing. If each successive swing is approximately five-sixths the length of the preceding swing, find the total distance the bob travels.