1. Annual compound interest rates are 13% in 1984, 11% in 1985, and 15% in 1986. Find the effective rate of compound interest per year which yields an equivalent return over the three-year period.

2. Suppose that $\delta_t = 0.04(1 + t)^{-1}$.
   (a) Find $a(t)$
   (b) I invest 10 at $t = 2$. What is the value of my investment at $t = 5$?

3. Two funds, X and Y, start with the same amount. Fund X accumulates at force of interest of 10%. Fund Y accumulates at a rate of interest $i$, compounded semiannually. At the end of 10 years, fund X is 1.1 times as big as fund Y. Calculate $i$.

4. Steve puts 100 into a fund that pays an effective annual rate of discount of 20% for the first two years, and a force of interest of rate $\delta_t = 2t/(t^2 + 8), 2 \leq t \leq 4$, for the next 2 years. At the end of four years, the amount in Steve’s account is the same as it would have been had he put 100 into an account paying interest at a nominal rate of $j$ per annum compounded quarterly for four years. Calculate $j$.

5. I borrow 100 at an annual interest rate of $j$ compounded semiannually. Six months later, the annual interest rate (compounded semiannually) suddenly goes up by 4%. One year after the loan, I owe 110.24. Find $j$. 