Practice Problem 1

You deposit $1,000 in your bank account.

a. If the bank pays 4% simple interest, how much will you accumulate in your account after 10 years?
b. How much will you accumulate if the bank pays compound interest?

Practice Problem 2

You can buy property today for $3 million and sell it in 5 years for $4 million. (You earn no rental income on the property.)

a. If the interest rate is 8%, what is the present value of the sales price?
b. Is the property investment attractive to you?
c. Would your answer to part (b) change if you also could earn $200,000 per-year rent on the property? The rent is paid at the end of each year.

Practice Problem 3

Professor's Annuity Corp. offers a lifetime annuity to retiring professors. For a payment of $80,000 at age 65, the firm will pay the retiring professor $600 a month until death.

a. If the professor's remaining life expectancy is 20 years, what is the monthly interest rate on this annuity?
b. What is the effective annual interest rate?
c. If the monthly interest rate is .5%, what monthly annuity payment can the firm offer to the retiring professor?

Practice Problem 4

Banks sometimes quote interest rates in the form of “add-on interest.” In this case, if a 1-year loan is quoted with a 20% interest rate and you borrow $1,000, then you pay back $1,200. But you make these payments in monthly installments of $100 each.

a. What is the true APR on this loan?
b. What is the effective annual rate on the loan?

Practice Problem 5

A couple will retire in 50 years; they plan to spend about $30,000 a year (real dollars) in retirement, which should last about 25 years. They believe that they can earn 8% interest on retirement savings. The inflation rate over the next 75 years is expected to average 5%.

a. What is the real annual savings the couple must set aside?
b. How much do they need to save in nominal terms in the first year?
c. How much do they need to save in nominal terms in the last year?
d. What will be their nominal expenditures in the first year of retirement?
e. What will be their nominal expenditures in the last year of retirement?