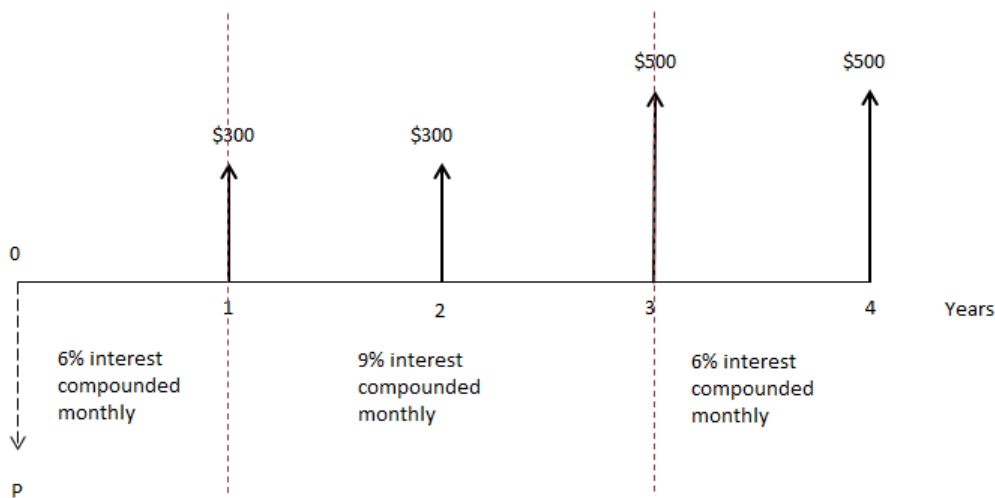


IE 342 STUDY SET 2

FALL 2016

Do not submit your solutions as they will not be graded!

- 1) College Financial Resources, which makes small loans to college students, offers to lend \$600. The borrower is required to pay \$48 at the end of each week for 20 weeks. Find the interest rate per week. What is the nominal interest rate per year? What is the effective interest rate per year?
- 2) A series of equal quarterly payments of \$8,000 for 20 years is equivalent to what present amount at an interest rate of 8% compounded at the given intervals?
 - a. Quarterly
 - b. Monthly
 - c. Continuously
- 3) What equal series of payments must be paid into a sinking fund to accumulate the following amounts?
 - a. \$55,000 in 10 years at 7.45% compounded semiannually when payments are semiannual.
 - b. \$35,000 in 15 years at 6.35% compounded quarterly when payments are quarterly.
 - c. \$30,000 in 5 years at 9.25% compounded monthly when payments are monthly.
- 4) Consider the each cash flow transactions depicted in the accompanying cash flow diagram with the changing interest rates specified.



- a. What is the equivalent present worth?
 - b. What is the single, effective annual interest rate over four years?
- 5) Consider the following two options for financing a car:
Option A. Purchase the vehicle at the normal price of \$26,200 and pay for the vehicle over three years with equal monthly payments at 1.9% APR financing.

Option B. Purchase the vehicle for a discount price of \$24,048 to be paid immediately. The funds that would be used to purchase the vehicle are presently earning 5% annual interest compounded monthly.

- a. What is the meaning of the APR of 1.9% quoted by the dealer?
 - b. Under what circumstances would you prefer to go with the dealer's financing?
 - c. Which interest rate (the dealer's interest rate or the savings rate) would you use in comparing two options?
- 6) Ed Hooks borrowed \$30,000 from a bank at an interest rate of 9% compounded monthly. The loan will be repaid in 36 equal monthly installments over 3 years. Immediately after his 20th payment, Ed desires to pay the remainder of the loan in a single payment. Compute the total amount he must pay.
- 7) Mr. Smith wants to buy a new car that will cost \$26,000. He will make a down payment in the amount of \$10,430. He would like to borrow the remainder from a bank at an interest rate of 12% compounded monthly. He agrees to pay off the loan monthly for a period of three years.
- a. What is the amount of monthly payment?
 - b. What is the balance remaining immediately after 18th payment? What is the interest and principal payments after 18th payment?
- 8) To buy a \$150,000 house, you take out a 9% (APR) mortgage for \$120,000. Five years later, you sell the house for \$185,000. What equity (the amount that you can keep before tax) would you realize with a 30-year repayment term?
- 9) Consider the following 3 individuals just after their 11th payment:
- Ronda Dixon had a balance of \$150,000 on a 6%, 15-year mortgage
 - Wally Harper had a balance of \$150,000 on a 6%, 20-year mortgage
 - Tammy Zang had a balance of \$150,000 on a 6%, 30-year mortgage
- How much interest did each individual pay on the 11th payment?
- 10) A house can be purchased for \$155,000, and you have \$25,000 cash for a down payment. You are considering the following two financial options:
- Option 1:** Getting a new standard mortgage with a 7.5% (APR) interest and a 30-year term.
- Option 2:** Assuming the seller's old mortgage, which has an interest rate of 5.5% (APR), a remaining term of 25 years (the original term was 30 years), a remaining balance of \$97,218, and payments of \$597 per month. You can obtain second mortgage for the remaining balance (\$32,782) from your credit union at 9% (APR) with a 10 years repayment period.
- a. What is the effective interest rate for combined mortgage?
 - b. Compute the monthly payments for each option over the life of the mortgage.
 - c. Compute the total interest payment for each option.
 - d. What homeowner's interest rate makes the two financing options equivalent?