

j. Amortization schedule; principal versus interest cost
amortized loan

- (4-2) What is an *opportunity cost rate*? How is this rate used in discounted cash flow analysis, and where is it shown on a time line? Is the opportunity rate a single number that is used to evaluate all potential investments?
- (4-3) An *annuity* is defined as a series of payments of a fixed amount for a specific number of periods. Thus, \$100 a year for 10 years is an annuity, but \$100 in Year 1, \$200 in Year 2, and \$400 in Years 3 through 10 does *not* constitute an annuity. However, the entire series *does contain* an annuity. Is this statement true or false?
- (4-4) If a firm's earnings per share are constant, is the firm's value constant?

(ST-3)
Effective Annual
Rates

Bank A pays 8% interest, compounded quarterly. The managers of Bank B want its money market account's effective annual rate to match Bank A, but Bank B will compound interest on a monthly basis. What nominal, or quoted, rate must Bank B set?

PROBLEMS

Answers Appear in Appendix B

Easy Problems 1-8

(4-1)

Future Value of a
Single Payment

If you deposit \$10,000 in a bank account that pays 10% interest annually, how much will be in your account after 5 years?

(4-2)

Present Value of a
Single Payment

What is the present value of a security that will pay \$5,000 in 20 years if securities of equal risk pay 7% annually?

(4-3)

Interest Rate on a
Single Payment

Your parents will retire in 18 years. They currently have \$250,000, and they think they will need \$1 million at retirement. What annual interest rate must they earn to reach their goal, assuming they don't save any additional funds?

(4-12)
Value of an
Annuity

Find the *future value* of the following annuities. The first payment in these annuities is made at the *end* of Year 1, so they are *ordinary annuities*. (Notes: See the Hint to Problem 4-9. Also, note that you can leave values in the TVM register, switch to Begin Mode, press FV, and find the FV of the annuity due.)

- a. \$400 per year for 10 years at 10%
- b. \$200 per year for 5 years at 5%
- c. \$400 per year for 5 years at 0%
- d. Now rework parts a, b, and c assuming that payments are made at the *beginning* of each year; that is, they are *annuities due*.

... ordinary annuities (see the Notes to

that on your bank deposit. You must calculate the value of the securities to decide whether they are a good investment. What is their present value to you?

(4-29)

Amortization

Assume that your aunt sold her house on December 31, and to help close the sale she took a second mortgage in the amount of \$10,000 as part of the payment. The mortgage has a quoted (or nominal) interest rate of 10%; it calls for payments every 6 months, beginning on June 30, and is to be amortized over 10 years. Now, 1 year later, your aunt must inform the IRS and the person who bought the house about the interest that was included in the two payments made during the year. (This interest will be income to your aunt and a deduction to the buyer of the house.) To the closest dollar, what is the total amount of interest that was paid during the first year?

Challenging
Problems 30-34